U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-256 800

# Handbook for Preparing Office of Research and Development Reports

Environmental Protection Agency

May 1976

PB256800

TECHNICAL REPORT DATA
*(Please read Instructions on the reverse before completing)*

| | |
|---|---|
| 1. REPORT NO. EPA-600/9-76-001 | 2. |
| 3. RECIPIENT'S ACCESSION NO. | |
| 4. TITLE AND SUBTITLE: Handbook for Preparing Office of Research and Development Reports | 5. REPORT DATE: May 1976 |
| | 6. PERFORMING ORGANIZATION CODE |
| 7. AUTHOR(S): Technical Information Staff | 8. PERFORMING ORGANIZATION REPORT NO. |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS: Technical Information Staff, Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268 | 10. PROGRAM ELEMENT NO. |
| | 11. CONTRACT/GRANT NO. |
| 12. SPONSORING AGENCY NAME AND ADDRESS: Same as Box 9 | 13. TYPE OF REPORT AND PERIOD COVERED |
| | 14. SPONSORING AGENCY CODE: EPA-ORD |

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This report contains specifications required by U.S. Environmental Protection Agency's Office of Research and Development to ensure that the results and conclusions of its various research, development, and demonstration programs are documented in a uniform, cost-effective, and quality manner. The specifications apply to all final scientific and technical reports that document inhouse, interagency, grant, and contract research activity. Included are the general format requirements concerning report organization, print size, image area, page numbering, use of illustrations and tables, etc. The essential items and the various sections of a report are illustrated with examples.

17. KEY WORDS AND DOCUMENT ANALYSIS

| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
|---|---|---|
| *Writing, Printability, *Specifications, Instructions, Technical writing, Documentation, *Technical Reports | U.S. Environmental Protection Agency, Office of Research and Development | OSG |

| | | |
|---|---|---|
| 18. DISTRIBUTION STATEMENT: Release to Public | 19. SECURITY CLASS (This Report): Unclassified | 21. NO. OF PAGES: 40 |
| | 20. SECURITY CLASS (This page): Unclassified | 22. PRICE: 4.00 |

EPA Form 2220-1 (9-73)



PRICES SUBJECT TO CHANGE

247029

PB 256 800

EPA-600/9-76-001
May 1976

# HANDBOOK for PREPARING OFFICE of RESEARCH and DEVELOPMENT REPORTS

OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

*This document supersedes all previous scientific and technical report preparation specifications that have been issued by the U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD) or its predecessor organizations. All technical and scientific reports prepared by or for ORD after the issuance of this document shall conform with the specifications contained herein.*

*These specifications substantially conform with and are intended to augment, existing EPA specifications contained in Chapters 1 and 2 of the Scientific and Technical Publications Manual, TN-3, dated May 14, 1974. Minor deviations from Agency specifications are the result of a redefinition of terms, superseded information, and/or newer approaches, (e.g., order of elements, use of blank pages, etc.).*

*These specifications are fully consistent with the ORD publication policy, which has been issued by the Assistant Administrator for Research and Development. This handbook is primarily intended for use by authors, principal investigators, project officers, and those individuals who provide staff support in preparing draft and camera-ready copy of ORD reports.*

*A companion document outlining procedures to be followed when publishing ORD work is available to assist ORD personnel in activities that involve internal processing, review, clearance, printing, distribution, and storage of ORD reports. Copies of these procedures are available from the Technical Information Coordinator assigned to each Laboratory and ORD Headquarters Office.*

EPA-600/9-76-001
May 1976

# HANDBOOK FOR PREPARING OFFICE OF RESEARCH AND DEVELOPMENT REPORTS

*Compiled by*
*Technical Information Staff*
*Office of Research and Development*
*Cincinnati, Ohio 45268*

TECHNICAL INFORMATION DIVISION
OFFICE OF MONITORING AND TECHNICAL SUPPORT
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

## DISCLAIMER

This report has been reviewed by the Office of Research and Development, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

# CONTENTS


Section 1. INTRODUCTION, 1
- Purpose, 1
- Applicability, 1
- Exclusions, 1
- Waivers, 1
- Extramural Considerations, 2

Section 2. GENERAL REQUIREMENTS, 3
- Sources of Information, 3
- Legal Considerations, 4
  - Copyrighted, contributed, or unpublished material, 4
  - Privately owned information, 5
  - Trade names and manufacturer's names, 5
  - Notification of draft documents, 5
  - Disclaimer notice, 5
- Metric Units of Measure, 5

Section 3. FORMAT SPECIFICATIONS AND SAMPLES, 6
- Overview, 6
- Report Organization (Order of Elements), 6
- General Format Requirements, 7
  - Covers, 7
  - Print size, 7
  - Image area, 7
  - Color printing, 8
  - Spacing and headings, 8
  - Page numbering, 8
  - Equations, footnotes, and abbreviations, 8
  - Illustrations, 9
  - Tables, 9
  - Fold ins and dividers, 9
  - Spine, 9
  - Paper saving considerations, 10
- Samples, 10
  - A. Typing Guide Sheet instructions, 11
  - B. Title page, 12
  - C. Disclaimer notice, 13
  - D. Foreword, 14
  - E. Preface, 15
  - F. Abstract, 16
  - G. Contents, 17
  - H. List of illustrations, 18
  - I. List of tables, 19
  - J. List of abbreviations and symbols, 20
  - K. Acknowledgment, 21
  - L. Introduction, 22
  - M. Conclusions, 23
  - N. Recommendations, 24
  - O. Page of text, 25
  - P. Illustrations, 26
  - Q. Tables, 27
  - R. References, 28
  - S. Bibliography, 29
  - T. Glossary, 30
  - U. Index, 31
  - V. Technical Report Data sheet, EPA Form 2220-1, 32

## ACKNOWLEDGMENT

We wish to acknowledge the considerable help and constructive suggestions provided by ORD's Technical Information Coordinators, other key ORD personnel who contributed to this document, and EPA's Office of Planning and Management. Although it was impossible to incorporate all the useful guidance and suggestions provided, we believe that the final specifications contained herein will more than adequately meet the needs of all performing organizations engaged in preparing ORD scientific and technical reports and that these efforts will result in more uniform and higher quality output of which we can all be proud.

# 1. INTRODUCTION

**Purpose**

This document contains specifications required by the Office of Research and Development (ORD) to ensure that the results and conclusions of its various research, development, and demonstration programs are documented in a uniform, cost-effective, and quality manner. It is specifically intended to assist those individuals responsible for preparing ORD scientific and technical reports.

**Applicability**

These specifications apply to all final scientific and technical reports, including draft and camera-ready copy of such reports, that are prepared and or printed as a result of ORD-sponsored conducted research. These specifications are to be followed by all EPA research components: the performing organization, the project officer, and all key personnel involved in preparing ORD scientific and technical reports. These reports are intended to include all final reports that document in-house, interagency, grant, and contract research activities performed by or for ORD; project reports that may report on the findings of several research activities required to produce a specific research output; or special reports that are specifically tailored to meet the needs of defined user groups. Examples of special reports include but are not limited to: criteria documents, state-of-the-art analysis, technology assessments, design manuals for pollution control or decision-making models, test protocols, or any other type of report providing operational or decision-making guidelines.

**Exclusions**

These specifications are not totally applicable for non-technical reports and studies, theses, bibliographies, training manuals, catalogs, administrative or fiscal reports, and manuscripts to be published by other than ORD (e.g., journals or symposia proceedings). Individuals responsible for preparing such reports should contact the Technical Information Staff (TIS), Cincinnati, Ohio, for additional guidance and assistance.

**Waivers**

Any deviation from these specifications must be approved by or through the Project Officer. Project Officers should forward any

request for approval of a major deviation through their assigned Technical Information Coordinator to the Technical Information Staff, Cincinnati, Ohio.

**Extramural Considerations**

Conformance with the specifications contained in this document and the form of submission must be cited in the final extramural agreement (interagency, grant, or contract). When the final report is complete and approved, the performing organization shall submit the reproducible manuscript (and printed copies if so specified) to the assigned Project Officer.

# 2. GENERAL REQUIREMENTS

This section provides information that is generally applicable to all ORD scientific and technical reports. It identifies important reference documents, applicable legal considerations, and criteria for units of measure.

**Sources of Information**

The following references are cited as supplemental sources for necessary and helpful information that can be used to prepare ORD scientific and technical reports. Other guides from engineering and scientific societies and journals may be used to the extent that they do not conflict with EPA or ORD specifications.

*Thesaurus of Engineering and Scientific Terms*, Department of Defense/Engineers Joint Council. This is a compilation of key words from which the identifiers required to complete Block 17a of the Technical Report Data Sheet, EPA 2220-1, must be selected. Each Technical Information Coordinator has been furnished with a copy, and additional copies are available from the National Technical Information Service (NTIS), Springfield, VA 22161, as order number AD 672 000.

*COSATI Subject Category List*, Office of Science and Technology, 1964. The Committee on Scientific and Technical Information's (COSATI) outline for uniformly arranging all subject matter used to complete Block 17c of the Technical Report Data sheet, EPA 2220-1. Each Technical Information Coordinator has been furnished with a copy, and additional copies are available from NTIS as order number AD 612 200.

*Government Printing and Binding Regulations*, Joint Committee on Printing, Congress of the United States, No. 23, Oct. 1974. This pamphlet provides background information on Government Printing Office requirements concerning the use of color printing, self-mailers, printing requirements resulting from grants or contracts, etc. Copies are available from U.S. Environmental Protection Agency, Printing Management and Distribution Section, Washington, D.C. 20460.

*Style Manual*, U.S. Government Printing Office, Washington, D.C., 1973. This manual contains general editorial advice

and the Federal government's recommended style for capitalization, punctuation, use of numerals, hyphenation, etc. It may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

*Metric Practice Guide*, ASTM E 380-76. This Guide deals with conversion of quantities in various measurement systems to the International System of Units (officially abbreviated SI in all languages). It is available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

*Units of Weight and Measure: International (Metric) and U.S. Customary*, L. J. Chisholm, U.S. Department of Commerce, National Bureau of Standards, NBS Misc. Pub. 286, revised Oct. 1972. This document provides definitions and conversion factors from various systems of measurement to the international system. It may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

**Legal Considerations**

The Government may be subject to liability for misuse of the literary or intellectual property (patents, trademarks, "proprietary information") of others. Report writers and editors should observe the following guidelines:

***Copyrighted, contributed, or unpublished material***

Copyrighted material may not be incorporated in a report unless written permission of the copyright owner has been obtained. Prior use of copyrighted material in another government publication does not necessarily constitute permission to use it in an EPA ORD publication. When permission has been obtained and the material is used in a report, it shall be identified by a statement substantially as follows:

> Reprinted from (title of publication, year of first publication) by (name of author) with permission of (name of copyright owner, if different from that of author).

Unpublished work may be protected under common law or equity, even though there is no copyright notice. Refer problems relating to the protection given to unpublished work to EPA's Office of General Counsel (Washington, D.C. 20460).

Courtesy requires that uncopyrighted materials from, or assistance rendered by, other persons be acknowledged through the use of a footnote, bibliographic reference, or statement in the text. Credit lines shall not be given for materials purchased by a department; nongovernment designers, typographers, or layout artists; and government art directors, designers, typographers, layout artists, or photographers.

*Privately owned information*

To avoid restricting the availability of a report, make every effort not to use information accepted by the government for limited purposes. Such information will be used only when it is essential to the understanding of a report and only after approval for its use is authorized by the Office of General Counsel. Reports containing such information will bear a statement restricting availability and handling, as required.

*Trade names and manufacturers' names*

The use of trade names, etc., should be explicitly brought to the attention of the Project Officer and the cognizant approving official before the report is cleared for publication.

*Notification of draft documents*

As a result of provisions contained in the Freedom of Information Act and for other programmatic reasons, draft copies of ORD reports are often distributed outside the Agency. To prevent misunderstanding, the following notice must appear in the top half of the first page of the general text of all draft scientific and technical reports:

> Notice
> This document is a preliminary draft. It has not been formally released by the U.S. Environmental Protection Agency and should not at this stage be construed to represent Agency policy. It is being circulated for comments on its technical merit and policy implications.

*Disclaimer notice*

Select the appropriate disclaimer statement indicated in Sample C of this document. The disclaimer notice will always appear on the reverse side of the title page.

**Metric Units of Measure**

The modernized metric system utilizing the International System of Units (Système International d'Unités, SI) shall be used unless otherwise specified by the Project Officer. Equivalent units may be expressed parenthetically, if desired. If other than metric measures are used, the reason for such use should be footnoted at the first nonmetric measure, and reference should be made to a conversion table included in the report.

# 3. FORMAT SPECIFICATIONS AND SAMPLES

**Overview**

This section identifies the format specifications to be followed by authors and typists when preparing either draft or final camera-ready copy ot ORD scientific and technical reports. It is to be used by others who are responsible for performing format reviews of ORD scientific and technical reports to ensure conformance with these specifications. Within any one report, strive for consistency; there are many acceptable modes for abbreviations, tables, figures, order of headings, etc. A common-sense, consistent approach will usually produce a visually acceptable document. The following paragraphs contain general information and typing guidelines that apply to all sections of the report, an outline of the major elements that usually appear within a report, and a sample of each major element. Each sample also contains specific guidance for the preparation of that element.

**Report Organization**

In the outline below, the major elements of most ORD scientific and technical reports are itemized. When some or all of the elements occur, they are included in the order shown. The outline also indicates, in the second column, those elements *required* for all reports (*); those elements that, although not required, would appear in most ORD reports (†); and those elements that are included only if needed to enhance communication with the reader or the utility of the report (‡). The third column indicates the sample (found in this volume) that illustrates and gives information about the particular element.

ORDER OF ELEMENTS

| *Element* | *How necessary* | *Sample* |
|---|---|---|
| FRONT COVER | | |
| FRONT MATTER | | |
| Title page | * | B |
| Disclaimer notice | * | C |
| Foreword | * | D |
| Preface | ‡ | E |
| Abstract | * | F |
| Contents | † | G |
| List of illustrations | † | H |
| List of tables | † | I |
| List of abbreviations and symbols | † | J |
| Acknowledgment | † | K |

| | | |
|---|---|---|
| **BODY OF REPORT** | | |
| Introduction | † | L |
| Conclusions | † | M |
| Recommendations | † | N |
| Text | * | O, P, Q |
| **BACK MATTER** | | |
| References | † | R |
| Bibliography | ‡ | S |
| Appendices | ‡ | — |
| Glossary | ‡ | T |
| Index | ‡ | U |
| Technical report data sheet, EPA Form 2220-1 | * | V |
| **BACK COVER** | | |
| **SPINE** | | |

* Element necessary; † element usually included; ‡ element optional.

**General Format Requirements**

This subsection provides specifications that are applicable to more than one of the report elements previously identified. It provides general specifications for report covers, print size, image area, spacing, headings, page numbering, equations, footnotes, abbreviations, illustrations, tables, fold-ins, dividers, and paper-saving considerations.

***Covers***

The Technical Information Staff (TIS), Cincinnati, Ohio, is responsible for preparing and issuing the camera-ready artwork for all covers (front, inside front, and back), including the assignment of report numbers for all ORD scientific and technical reports. Requests to TIS for cover artwork and report numbers must be submitted through the cognizant Project Officer and Technical Information Coordinator.

***Print size***

Print size for text should not be less than 8-point type, or approximately 1/9 of an inch, when printed in the final report.

This is an example of 8-point type.

Tabular material or callouts on illustrations may, however, be printed in 6-point type, or approximately 1/12 of an inch when printed in the final report.

This is an example of 6-point type.

***Image area***

Final camera-ready copy of ORD reports must be prepared within an image area of 6½ by 9⅛ inches (16.51 by 23.18 cm)

(including page number). Detailed specifications for preparing a Typing Guide Sheet (TGS) consistent with these requirements and instructions for its use are contained in Sample A. A supply of TGS's is available upon request by writing the U.S. Environmental Protection Agency, Office of Research and Development, Technical Information Staff, Cincinnati, Ohio 45268 or by calling 513-684-7551.

*Color printing*

The use of color must be approved by the EPA Headquarters Printing Management Office. The Project Officer will submit the request.

*Spacing and headings*

The DRAFT of a final report (prepared for approval of the Project Officer) shall be typed double space or space-and-a-half. After approval by the Project Officer, the original (or camera-ready) copy of the FINAL report shall be typed single space on one side of good quality paper, which is suitable for reproduction (see Sample O).

Headings should stand out from the text, and the relative importance of each heading should be readily apparent.

*Page numbering*

Front Matter (Preliminary Pages): Except for the title page (which is counted as page i, but not indicated), number the front matter consecutively with lower case Roman numerals (ii, iii, iv, etc.).

Body of the Report and Back Matter: Only the first page of the body of the report (normally, the Introduction) begins on a new right-hand page (page 1); thereafter each new section begins on the next available page. Number the body of the report and the back matter consecutively with Arabic numbers. Allow no blank pages.

*Equations, footnotes, and abbreviations*

Equations: Short, simple, and unnumbered equations should be treated as part of the text. When possible, type simple fractions on one line using a diagonal line and parentheses to avoid ambiguity, e.g., $1/(a+b)$, not $1/a+b$ or $\frac{1}{a+b}$. Treat equations (and formulas) that require special symbols, positioning, or brackets as figures, and display the equation on a line by itself, centered on the width of the page with spacing (e.g., 1½ lines) above and below.

Instructions concerning mathematical and chemical equations–that is, the numbering, defining of symbols, breaking (dividing), building up, enclosing in parentheses, etc.–can be found in the Government Printing Office *Style Manual*

and in other style manuals such as those issued by the American Chemical Society (1155 Sixteenth St., N.W., Washington, D.C. 20036) or the American Society of Civil Engineers (345 East 47th Street, New York, NY 10017).

Footnotes: In the text, footnotes should be kept to a minimum. The symbols used for table footnotes (*, †, ‡) may be followed, or superscript numerals may be used, if desired.

Abbreviations: Acceptable modes for general abbreviations are found in standard dictionaries and in the Government Printing Office's *Style Manual.* Technical abbreviations may be found in the appropriate reference documents for the particular subject area involved. (See also Sample J.)

***Illustrations***

Illustrations should be treated consistently throughout the document and used only if they: relate entirely to the transaction of public business and are in the public interest; relate directly to the subject matter and are necessary to explain the text; do not aggrandize any individual; are in good taste; are restricted to the minimum size necessary for the purpose; or illustrate employees engaged in work- or service-related duties. Examples and instruction on preparing illustrations are given with Sample P.

***Tables***

The Government Printing Office's *Style Manual* may be helpful for preparing tables. When a report contains only a few pages of text and many tables, place tables in numerical sequence following the text. A typical table used in an ORD report and suggestions for preparing tables are given with Sample Q.

***Fold-ins and divider pages***

Do not use divider pages–those that merely serve to separate the report into parts. The use of fold-ins is also strongly discouraged. The paper, printing, binding efforts, and costs normally incurred when using fold-ins can usually be saved with preliminary planning: reduce wide tables, have tables fall on successive pages, separate maps into several parts, etc.

***Spine***

An identifying brief title and the report number will be printed on the backbone or spine of each ORD publication having a thickness of approximately ¼ inch or more (¼ inch is approximately 96 pages).

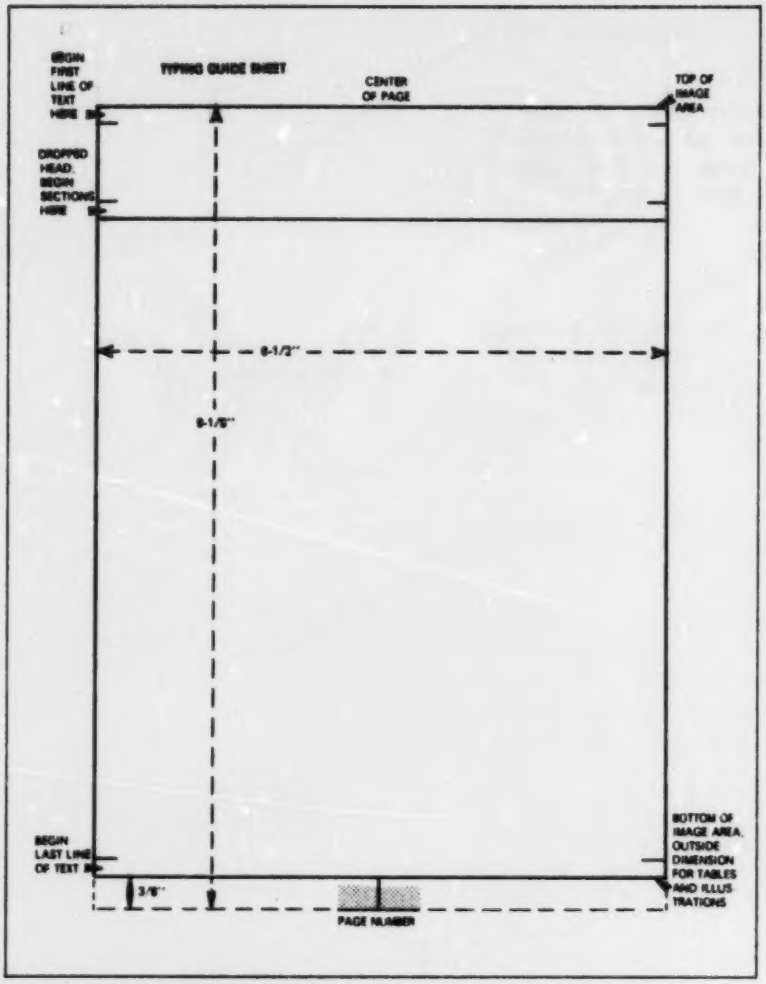
***Paper saving considerations***

Because of the rising cost and scarcity of paper and increased shipping and mailing costs, reproduction costs, book

storage and shelving costs, etc., each individual responsible for preparing ORD reports is strongly encouraged to consider appropriate techniques for saving paper. Suggestions for this purpose include: reducing and cropping tables, figures, and photographs to their smallest usable size; combining tables and figures with text on one page; and where practical, placing lists of items in double columns.

**Samples**

This subsection provides examples of each major element of an ORD report (previously listed in the paragraph entitled "Report Organization") and examples of material such as the Typing Guide Sheet, illustrations, tables, etc. (described in the above material on "General Format Requirements"). Each sample is intended to illustrate an acceptable form, style, and content for the particular element or area of the report being addressed and to provide additional guidance that will assist the individual responsible for preparing that element/area of a given report.




The drawing above specifies the required image area to be used for preparing final camera-ready copy of ORD reports. Typing Guide Sheets (TGS) for this purpose are available from the Technical Information Staff, Cincinnati, Ohio.

When using a TGS for normal text, begin typing one line below the top of the image area border. Fill the page fully, but do not exceed the line indicated for "last line of text." For front matter (preliminary pages) and section headings, begin typing on the "dropped head" line.

If tables and illustrations occupy or can be reduced to occupy less than a full page, combine with text. If, however, a table or illustration will occupy the greater portion of the image area, center it within the image area. Oversized tables or illustrations should be reduced to fit within the TGS image area or be separated into parts and placed on several succeeding pages.

Place page numbers on the line at the tick mark (identified at Page No.). The printer can use properly placed page number as a benchmark to position (align) pages; this aids in presenting a uniform appearance to the report.

**Sample A. Typing Guide Sheet Instructions.**

Supplied by TIS

For grant, contract, or interagency agreement, list authors (without degrees or titles) as they appear on EPA Form 2220-1, Block 1, together with their organizational name and location.

For in-house reports, list authors (without degrees or titles), their first organizational subdivision (e.g., division), and the laboratory/office name and address.

For grants or contracts, add appropriate extramural number.

For grant, contract, or interagency agreement, give Project Officer (without degree or title), the first organizational subdivision (e.g., division), and the laboratory/office name and address.

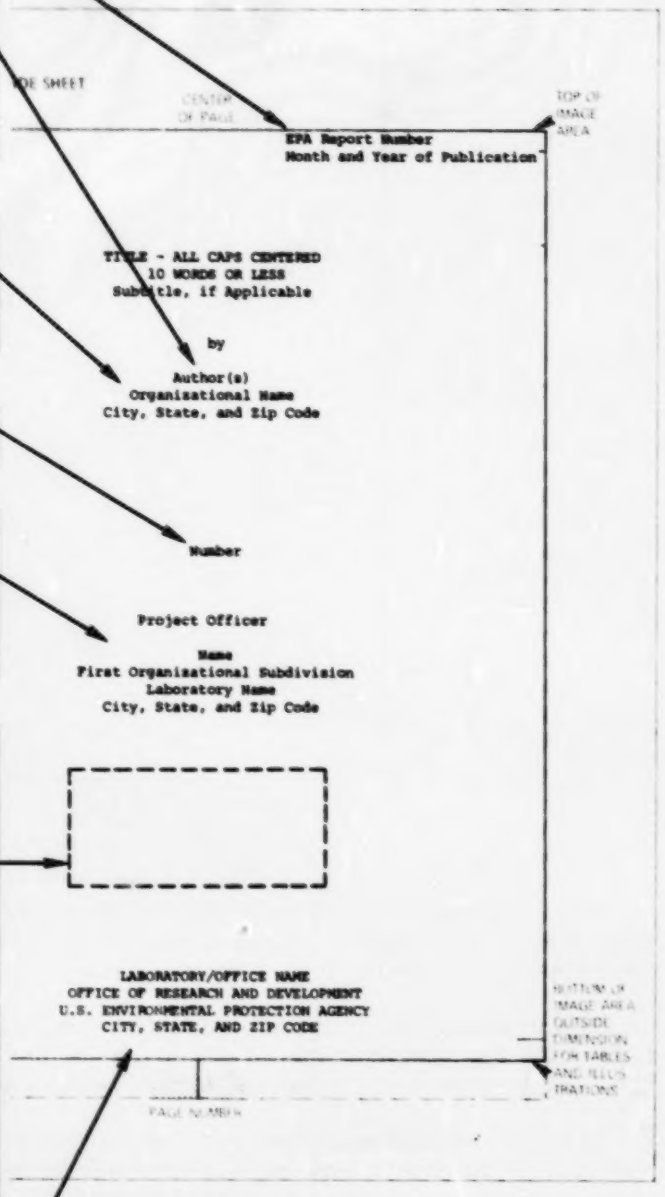
When a public or private organization originates the report in cooperation with EPA, reflect that information several spaces below the Project Officer's name and address:

This study was conducted
in cooperation with
U.S. Department of Agriculture
Beltsville, Maryland 20705

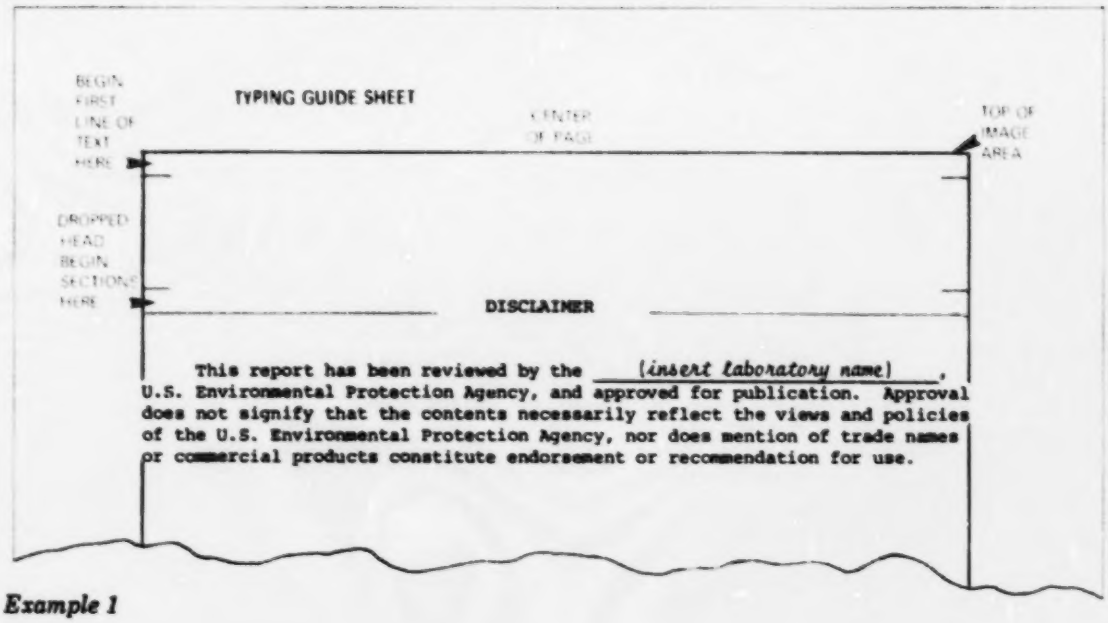
When an in-house study was performed for another governmental agency, add

Prepared for
Department of Defense
Washington, D.C. 20305

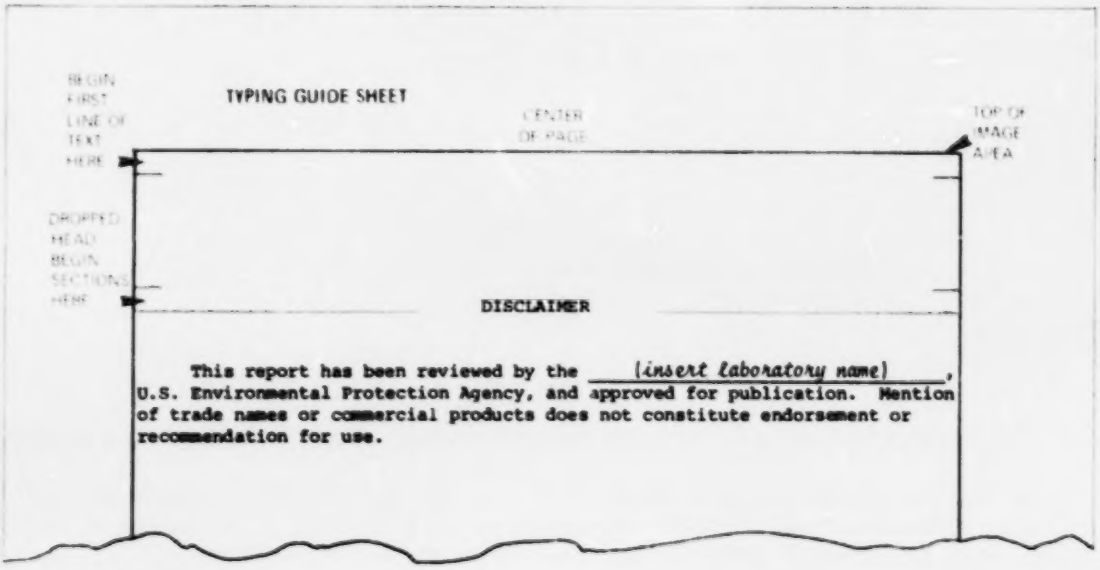
Publishers full name always appears on title page. Place city, state, and zip code on TGS's "last line of text" line.




**Sample B. Title page.**


TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTION HERE
DISCLAIMER
This report has been reviewed by the (insert laboratory name), U.S. Environmental Protection Agency, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

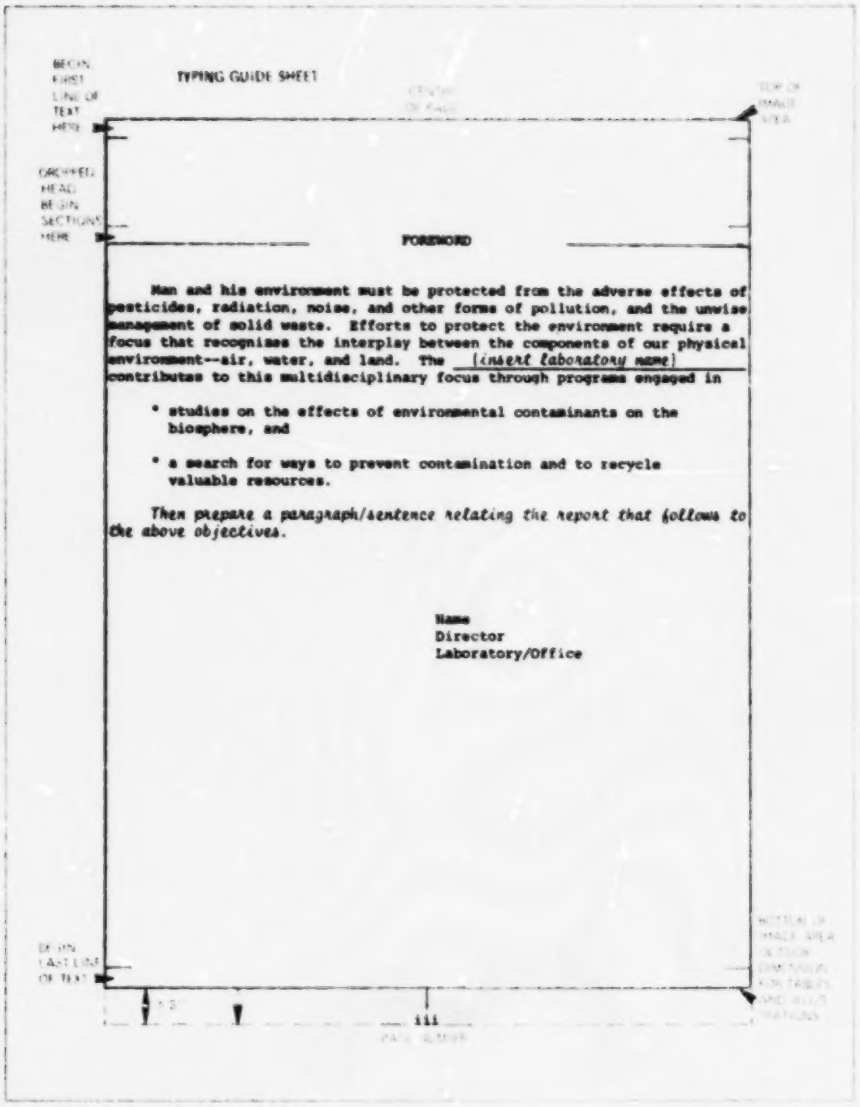
*Example 1*


TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTION HERE
DISCLAIMER
This report has been reviewed by the (insert laboratory name), U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

*Example 2*

**For grants or contracts use Example 1; for in-house reports, use Example 2.**

**Sample C. Disclaimer notice.**


TYPING GUIDE SHEET
FOREWORD
Man and his environment must be protected from the adverse effects of pesticides, radiation, noise, and other forms of pollution, and the unwise management of solid waste. Efforts to protect the environment require a focus that recognizes the interplay between the components of our physical environment--air, water, and land. The {insert laboratory name} contributes to this multidisciplinary focus through programs engaged in
• studies on the effects of environmental contaminants on the biosphere, and
• a search for ways to prevent contamination and to recycle valuable resources.
Then prepare a paragraph/sentence relating the report that follows to the above objectives.
Name
Director
Laboratory/Office
iii

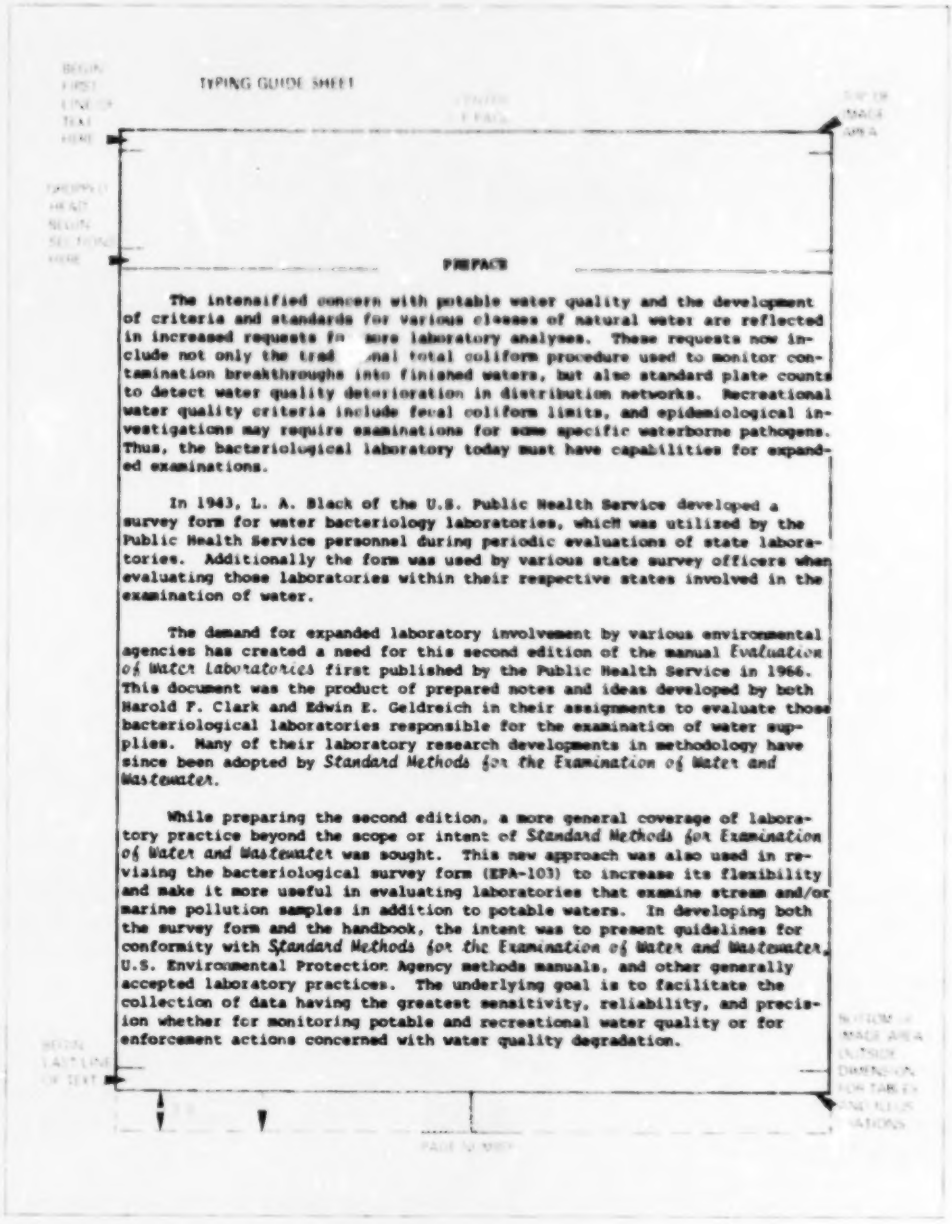
The Foreword is a statement from someone other than the author and is signed by that person.

In ORD reports, the format is structured so that the first paragraph describes the type of research, or direction, of the originating laboratory/office and its relation to the overall purpose of EPA or to the laws under which EPA, the laboratory, or the office operates.

The last paragraph (or sentence) can be used by the author or Project Officer to relate, in lay language, the work being reported to the overall objectives of the laboratory–consider the subject matter, the potential reader, the application of the reported work.

The Foreword for each laboratory should differ; this sample is intended only as a guide.

**Sample D. Foreword.**



TYPING GUIDE SHEET

PREFACE

The intensified concern with potable water quality and the development of criteria and standards for various classes of natural water are reflected in increased requests for more laboratory analyses. These requests now include not only the traditional total coliform procedure used to monitor contamination breakthroughs into finished waters, but also standard plate counts to detect water quality deterioration in distribution networks. Recreational water quality criteria include fecal coliform limits, and epidemiological investigations may require examinations for some specific waterborne pathogens. Thus, the bacteriological laboratory today must have capabilities for expanded examinations.

In 1943, L. A. Black of the U.S. Public Health Service developed a survey form for water bacteriology laboratories, which was utilized by the Public Health Service personnel during periodic evaluations of state laboratories. Additionally the form was used by various state survey officers when evaluating those laboratories within their respective states involved in the examination of water.

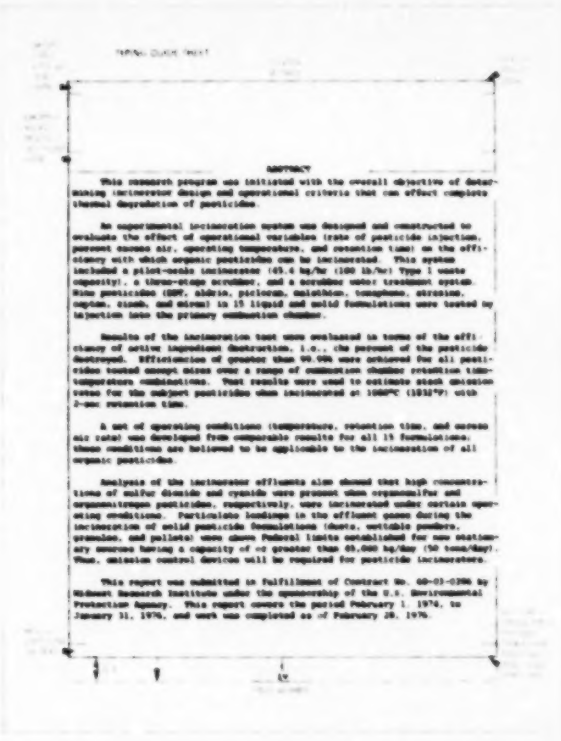
The demand for expanded laboratory involvement by various environmental agencies has created a need for this second edition of the manual *Evaluation of Water Laboratories* first published by the Public Health Service in 1966. This document was the product of prepared notes and ideas developed by both Harold F. Clark and Edwin E. Geldreich in their assignments to evaluate those bacteriological laboratories responsible for the examination of water supplies. Many of their laboratory research developments in methodology have since been adopted by *Standard Methods for the Examination of Water and Wastewater*.

While preparing the second edition, a more general coverage of laboratory practice beyond the scope or intent of *Standard Methods for Examination of Water and Wastewater* was sought. This new approach was also used in revising the bacteriological survey form (EPA-103) to increase its flexibility and make it more useful in evaluating laboratories that examine stream and/or marine pollution samples in addition to potable waters. In developing both the survey form and the handbook, the intent was to present guidelines for conformity with *Standard Methods for the Examination of Water and Wastewater*, U.S. Environmental Protection Agency methods manuals, and other generally accepted laboratory practices. The underlying goal is to facilitate the collection of data having the greatest sensitivity, reliability, and precision whether for monitoring potable and recreational water quality or for enforcement actions concerned with water quality degradation.

A report may include a preface prepared by the author. Here the author can include such information as the reasons for undertaking the work, the research method if it might bear on the reader's understanding of the text, or the limitations within which the subject was studied. Because the reader assumes the preface was written by the author, it usually is not signed.

If a preface is used, it follows the Foreword on a new page.

**Sample E. Preface.**



Abstracts are precis of the contents of the report and are intended to make it unnecessary for readers to refer to the original report unless the material is of real interest to them. They may be indicative or informative.

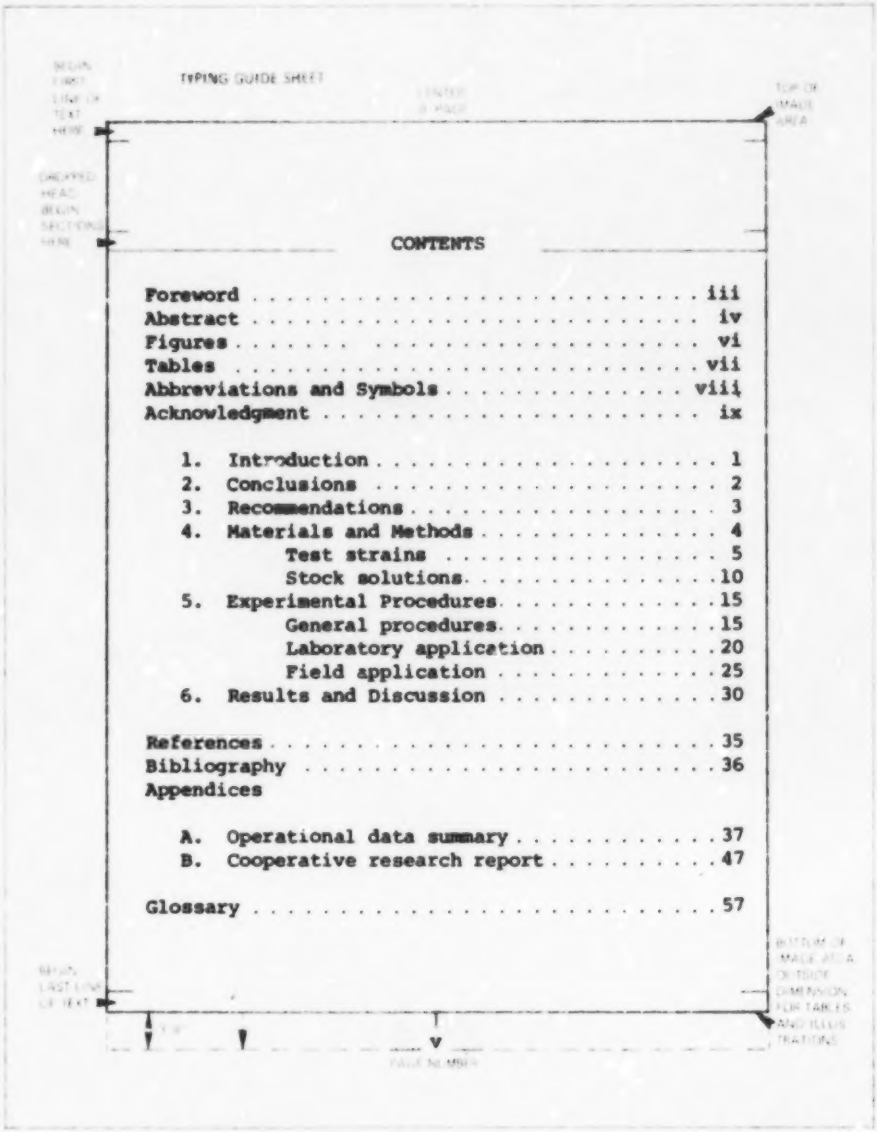
The indicative (descriptive) abstract is generally limited to between 200 and 250 words; it tells the reader what the report is about–narrative facts about what will be read in the actual report. An informative abstract gives details, in the most concise manner, of what was reported and presents conclusions and results.

The EPA 2220-1 Form (Technical Report Data form, Sample V) limits the abstract to 200 words and, thus, generally permits the use of the indicative abstract. The Abstract, as it appears on page iv of a report, may contain up to 450 words, which permits the use of an informative-type abstract. If desired, an expanded, executive-type summary could be substituted here for the Abstract.

In the "work-done-under" statement, which is always placed as the last paragraph of the abstract in extramural reports, the relationship of the prime and the subgrantee or subcontractor can be described in addition to the necessary information contained in the following statement: This report was submitted in fulfillment of (*grant or contract number*) by (*contractor or grantee*) under the (partial) sponsorship of the U.S. Environmental Protection Agency. This report covers a period from (*date*) to (*date*), and work was completed as of (*date*).

On in-house project reports, the following statement is always the last paragraph of the abstract: This report covers a period from (*date*) to (*date*) and work was completed as of (*date*).

**Sample F. Abstract.**


TYPING GUIDE SHEET
CONTENTS
Foreword . . . . . iii
Abstract . . . . . iv
Figures . . . . . vi
Tables . . . . . vii
Abbreviations and Symbols . . . . . viii
Acknowledgment . . . . . ix
1. Introduction . . . . . 1
2. Conclusions . . . . . 2
3. Recommendations . . . . . 3
4. Materials and Methods . . . . . 4
Test strains . . . . . 5
Stock solutions . . . . . 10
5. Experimental Procedures . . . . . 15
General procedures . . . . . 15
Laboratory application . . . . . 20
Field application . . . . . 25
6. Results and Discussion . . . . . 30
References . . . . . 35
Bibliography . . . . . 36
Appendices
A. Operational data summary . . . . . 37
B. Cooperative research report . . . . . 47
Glossary . . . . . 57
v

The contents page should begin on a new right-hand page, usually "v." Although preliminary pages (front matter) are not part of the subject matter, they are part of the document and are included in the contents.

The contents include the main headings of the document and the pages on which they appear; use of leadering may aid readability. Meaningful subheads (indented and subordinated) may be included, if necessary. Avoid double spacing between major sections when it would cause contents to have a short overrun on the following page. Omit contents on short, under 24- to 32-page documents or if unnecessary.

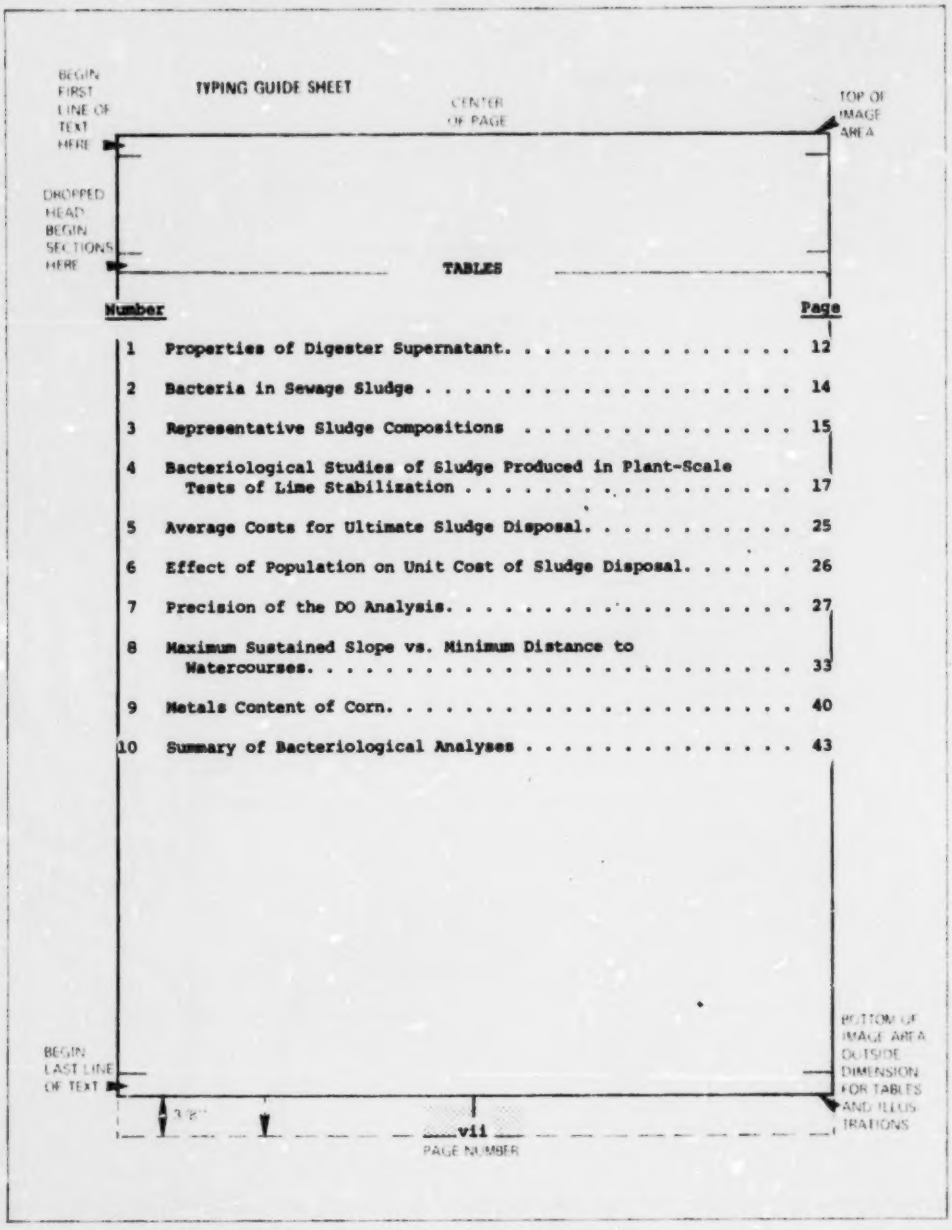
**Sample G. Contents.**

TYPING GUIDE SHEET
FIGURES
Number
Page
1 Schematic of sewage treatment operations sludge characteristics . . . . . 9
2 Schematic of existing sewage treatment plants modified to provide secondary and/or tertiary treatment. . . . . 10
3 Questionnaire used in mail survey . . . . . 55
4 Distribution of sewage treatment plants using land-spreading on a routine basis. . . . . 64
8 Sample collection points for multi-stage activated sludge system. . . . . 74
9 Effects of time and temperature on bacterial survival during sample storage . . . . . 78
vi

A list of illustrations (figures, maps, charts, plates) need be included only if considered helpful or essential. For each illustration, give the figure number, the figure legend as it appears in the report (in shortened form, if lengthy), and the page number. Avoid double spacing when it would cause a list of figures to have a short overrun on the following page.

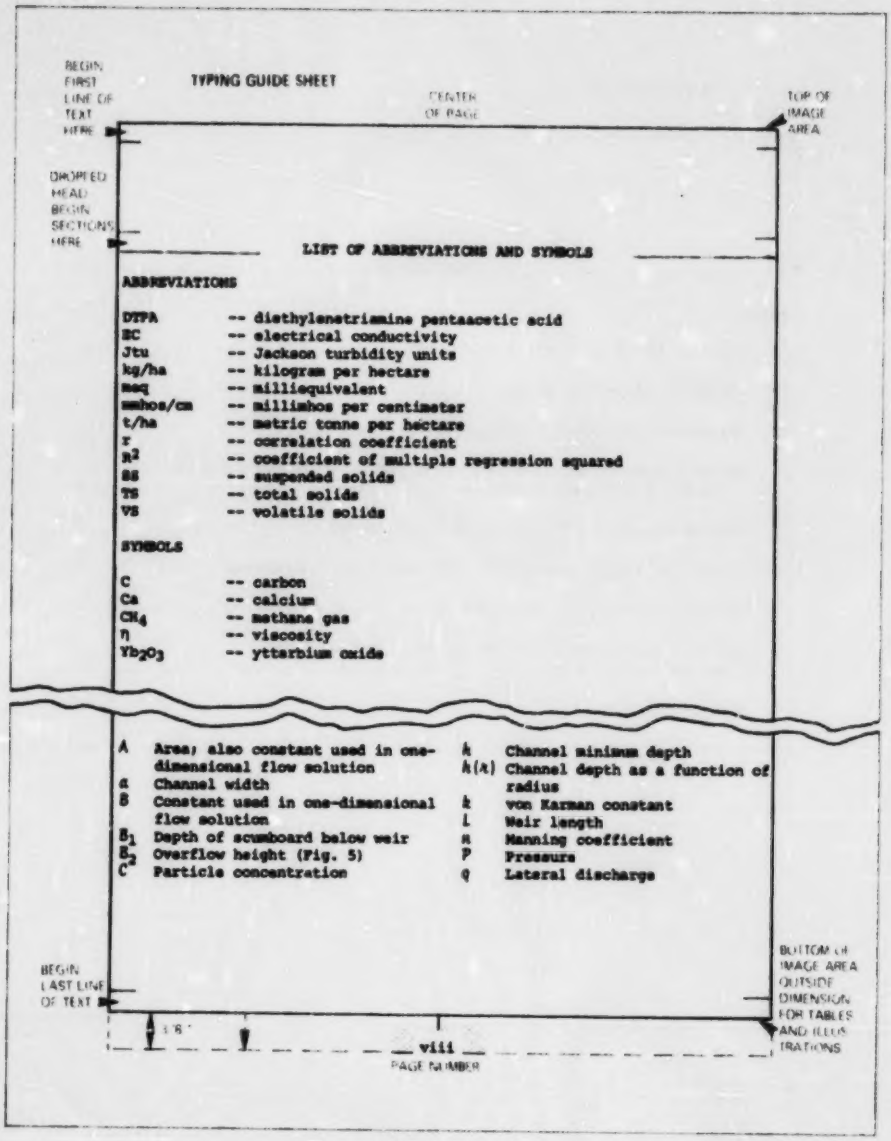
If lists of tables and illustrations are short, combine on one page or combine with contents page.

**Sample H. List of Illustrations.**


BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD: BEGIN SECTIONS HERE
TABLES
Number
Page
1 Properties of Digester Supernatant. . . . . 12
2 Bacteria in Sewage Sludge . . . . . 14
3 Representative Sludge Compositions . . . . . 15
4 Bacteriological Studies of Sludge Produced in Plant-Scale Tests of Lime Stabilization . . . . . 17
5 Average Costs for Ultimate Sludge Disposal. . . . . 25
6 Effect of Population on Unit Cost of Sludge Disposal. . . . . 26
7 Precision of the DO Analysis. . . . . 27
8 Maximum Sustained Slope vs. Minimum Distance to Watercourses. . . . . 33
9 Metals Content of Corn. . . . . 40
10 Summary of Bacteriological Analyses . . . . . 43
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3/8"
vii
PAGE NUMBER

A list of tables need be included only if considered helpful or essential. For each table, give table number, table caption as it appears in the report (shortened if necessary), and page number. Avoid double spacing when it would cause lists of tables to have a short overrun on the following page. If lists of tables and figures are short, combine on one page, or combine with table of contents.

**Sample I. List of tables.**

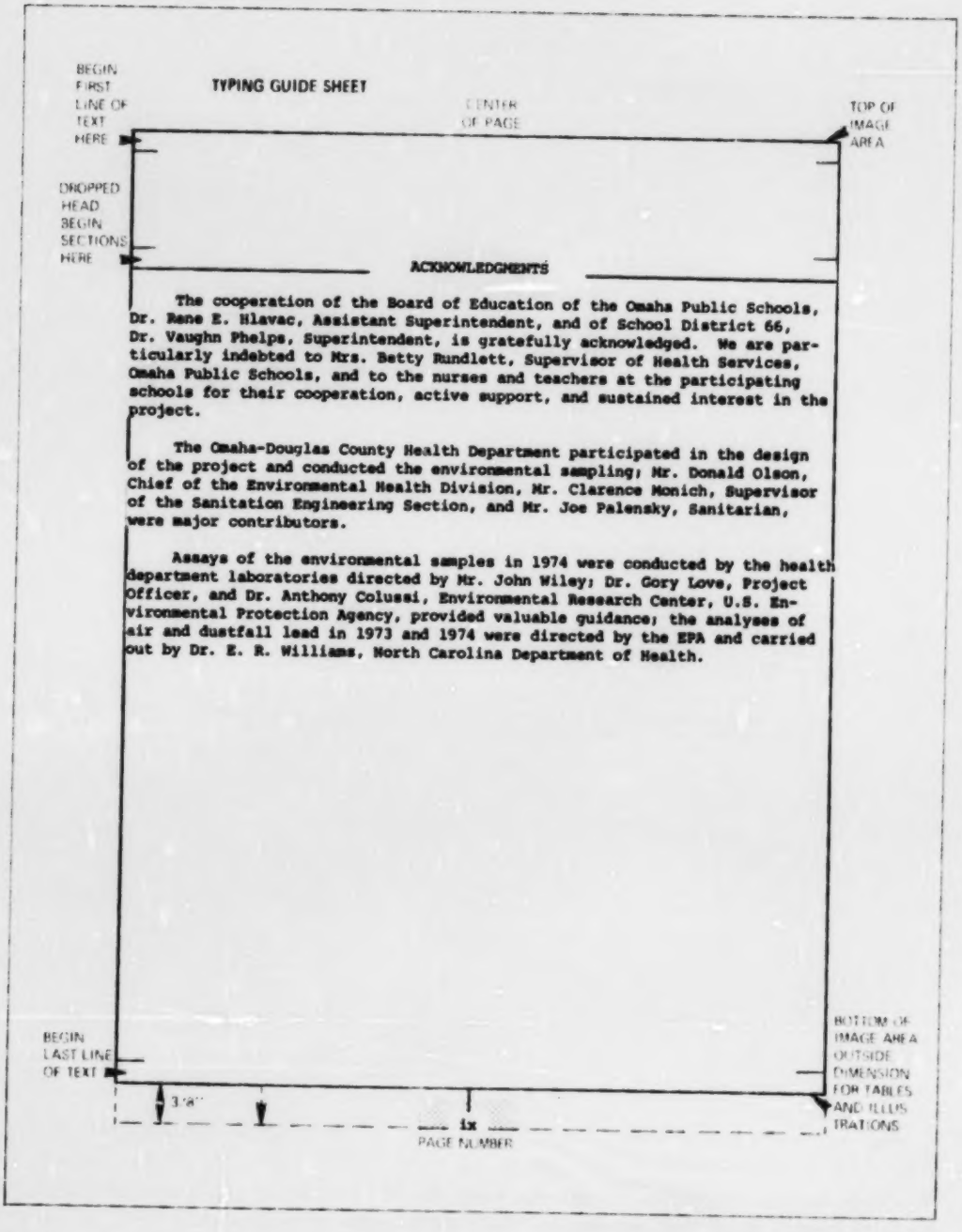

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTIONS HERE
LIST OF ABBREVIATIONS AND SYMBOLS
ABBREVIATIONS
DTPA -- diethylenetriamine pentaacetic acid
EC -- electrical conductivity
Jtu -- Jackson turbidity units
kg/ha -- kilogram per hectare
meq -- milliequivalent
mmhos/cm -- millimhos per centimeter
t/ha -- metric tonne per hectare
r -- correlation coefficient
$R^2$ -- coefficient of multiple regression squared
SS -- suspended solids
TS -- total solids
VS -- volatile solids
SYMBOLS
C -- carbon
Ca -- calcium
$CH_4$ -- methane gas
η -- viscosity
$Yb_2O_3$ -- yttarbium oxide
A Area; also constant used in one-dimensional flow solution
a Channel width
B Constant used in one-dimensional flow solution
$B_1$ Depth of scumboard below weir
$B_2$ Overflow height (Fig. 5)
C Particle concentration
h Channel minimum depth
h(x) Channel depth as a function of radius
k von Karman constant
L Weir length
n Manning coefficient
P Pressure
q Lateral discharge
BEGIN LAST LINE OF TEXT HERE
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
1"
viii
PAGE NUMBER

Abbreviations of symbols for the less common or specialized terms used in the text should be given in parentheses following their first use in the text. Thereafter, the abbreviation or symbol may be used.

When is a list necessary? For each report, define the possible readership, the number of abbreviations and symbols used, and the unusualness of or difficulty in defining or understanding these terms; if assembling and defining them will aid the reader, do so.

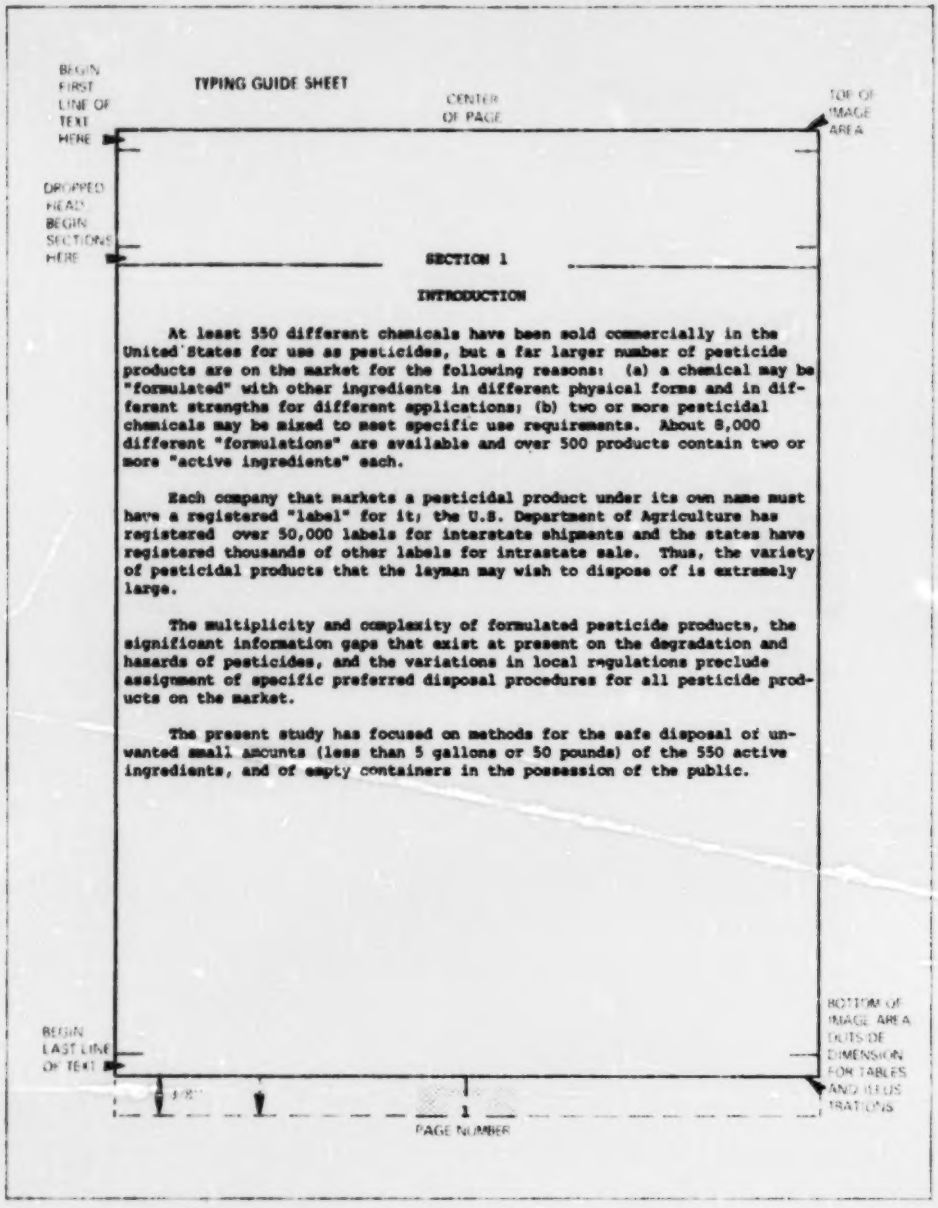
Consider using two columns when the list exceeds more than one page.

**Sample J. List of abbreviations and symbols.**


BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTIONS HERE
ACKNOWLEDGMENTS
The cooperation of the Board of Education of the Omaha Public Schools, Dr. Rene E. Hlavac, Assistant Superintendent, and of School District 66, Dr. Vaughn Phelps, Superintendent, is gratefully acknowledged. We are particularly indebted to Mrs. Betty Rundlett, Supervisor of Health Services, Omaha Public Schools, and to the nurses and teachers at the participating schools for their cooperation, active support, and sustained interest in the project.
The Omaha-Douglas County Health Department participated in the design of the project and conducted the environmental sampling; Mr. Donald Olson, Chief of the Environmental Health Division, Mr. Clarence Monich, Supervisor of the Sanitation Engineering Section, and Mr. Joe Palensky, Sanitarian, were major contributors.
Assays of the environmental samples in 1974 were conducted by the health department laboratories directed by Mr. John Wiley; Dr. Gory Love, Project Officer, and Dr. Anthony Colussi, Environmental Research Center, U.S. Environmental Protection Agency, provided valuable guidance; the analyses of air and dustfall lead in 1973 and 1974 were directed by the EPA and carried out by Dr. E. R. Williams, North Carolina Department of Health.
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
3"/8"
1x
PAGE NUMBER

**Limit acknowledgments to key personnel and organizations associated with the project that have aided in a major way, e.g., by supplying material or equipment, doing special studies, interpreting special data, or doing statistical analyses. Use simple, formal, and concise wording. Ordinarily, supporting staff work is not included in an acknowledgment.**

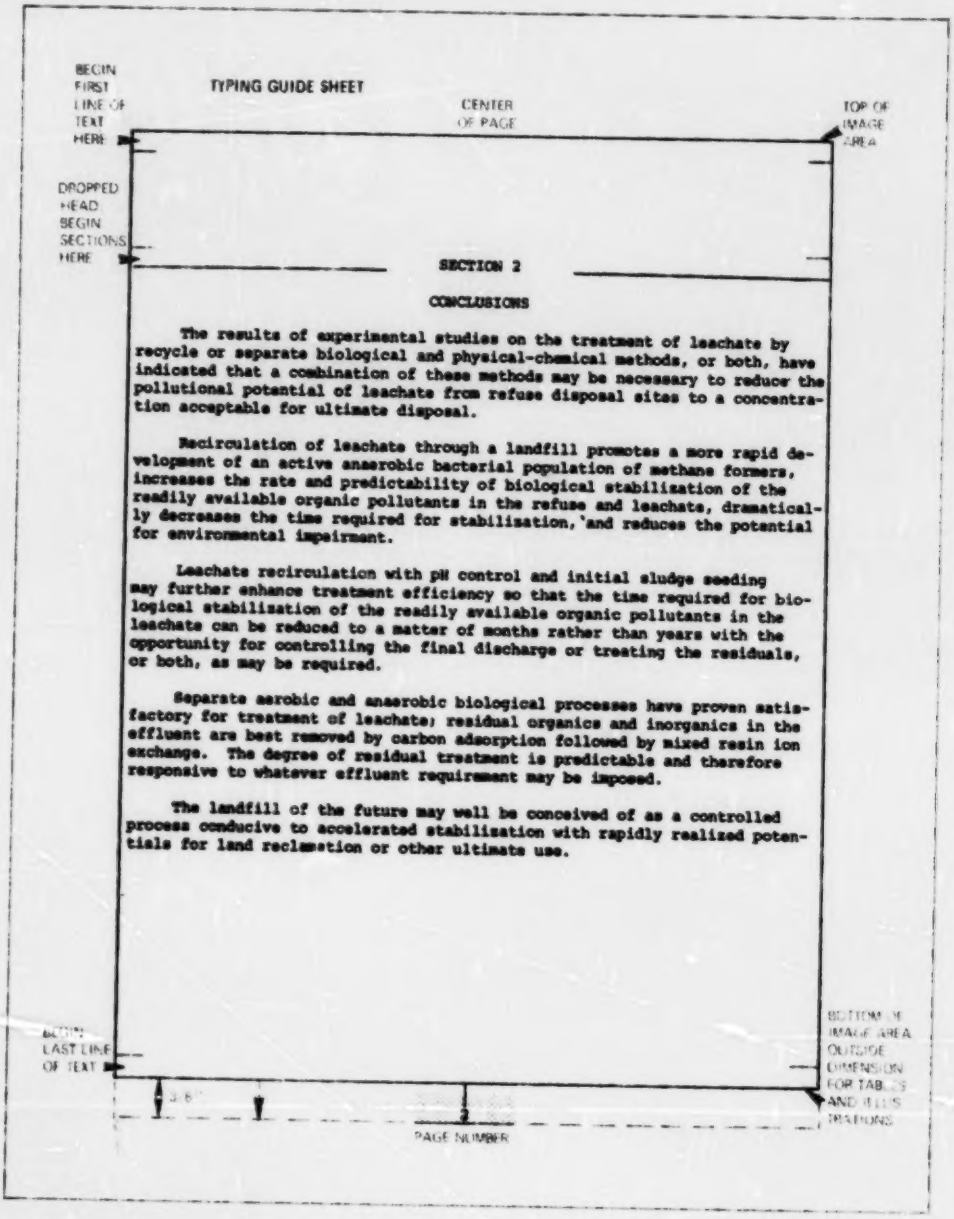
**Sample K. Acknowledgment.**


TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTIONS HERE
SECTION 1
INTRODUCTION
At least 550 different chemicals have been sold commercially in the United States for use as pesticides, but a far larger number of pesticide products are on the market for the following reasons: (a) a chemical may be "formulated" with other ingredients in different physical forms and in different strengths for different applications; (b) two or more pesticidal chemicals may be mixed to meet specific use requirements. About 8,000 different "formulations" are available and over 500 products contain two or more "active ingredients" each.
Each company that markets a pesticidal product under its own name must have a registered "label" for it; the U.S. Department of Agriculture has registered over 50,000 labels for interstate shipments and the states have registered thousands of other labels for intrastate sale. Thus, the variety of pesticidal products that the layman may wish to dispose of is extremely large.
The multiplicity and complexity of formulated pesticide products, the significant information gaps that exist at present on the degradation and hazards of pesticides, and the variations in local regulations preclude assignment of specific preferred disposal procedures for all pesticide products on the market.
The present study has focused on methods for the safe disposal of unwanted small amounts (less than 5 gallons or 50 pounds) of the 550 active ingredients, and of empty containers in the possession of the public.
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
BEGIN LAST LINE OF TEXT
1
PAGE NUMBER

The introduction, as Section 1, sets the stage for the conclusions and recommendations and for the text proper. With this orientation, the reader learns what he should know before he reads the other sections of the report. In one (or two) pages, the problem is stated and the present work is related to earlier work.

A formal introduction, as such, may not be needed in all reports; in simple, short reports, this information could be combined with conclusions or conclusions and recommendations.

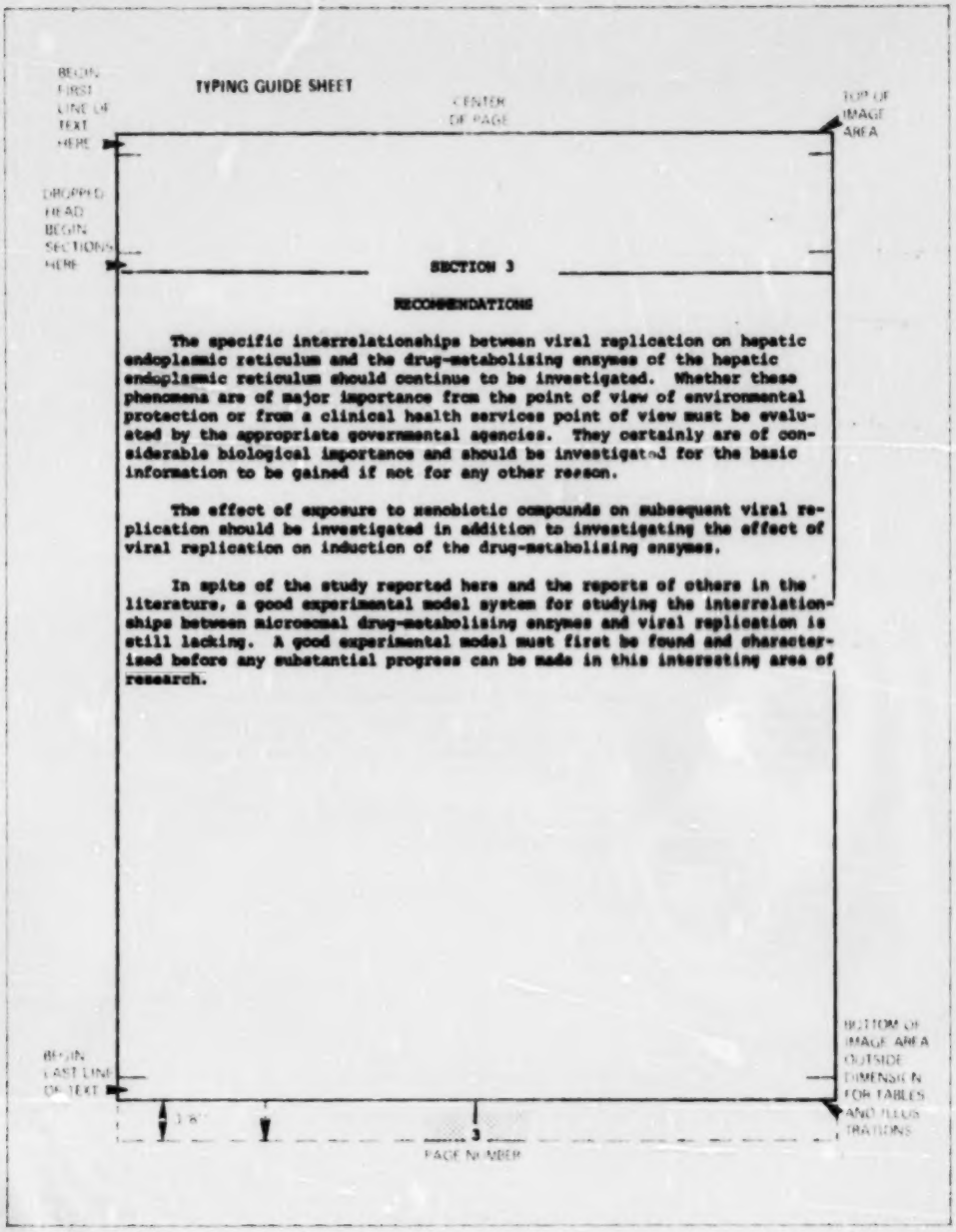
**Sample L. Introduction.**


BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTIONS HERE
SECTION 2
CONCLUSIONS
The results of experimental studies on the treatment of leachate by recycle or separate biological and physical-chemical methods, or both, have indicated that a combination of these methods may be necessary to reduce the pollutional potential of leachate from refuse disposal sites to a concentration acceptable for ultimate disposal.
Recirculation of leachate through a landfill promotes a more rapid development of an active anaerobic bacterial population of methane formers, increases the rate and predictability of biological stabilization of the readily available organic pollutants in the refuse and leachate, dramatically decreases the time required for stabilization, and reduces the potential for environmental impairment.
Leachate recirculation with pH control and initial sludge seeding may further enhance treatment efficiency so that the time required for biological stabilization of the readily available organic pollutants in the leachate can be reduced to a matter of months rather than years with the opportunity for controlling the final discharge or treating the residuals, or both, as may be required.
Separate aerobic and anaerobic biological processes have proven satisfactory for treatment of leachate; residual organics and inorganics in the effluent are best removed by carbon adsorption followed by mixed resin ion exchange. The degree of residual treatment is predictable and therefore responsive to whatever effluent requirement may be imposed.
The landfill of the future may well be conceived of as a controlled process conducive to accelerated stabilization with rapidly realized potentials for land reclamation or other ultimate use.
LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
1.0"
PAGE NUMBER

After all the measurements are made–the surveys conducted–the experiments performed–and the significance of these results analyzed and interpreted—what problems did this research solve? These are the conclusions. If the problem was not solved or major mistakes or hazards occurred, they can be included here.

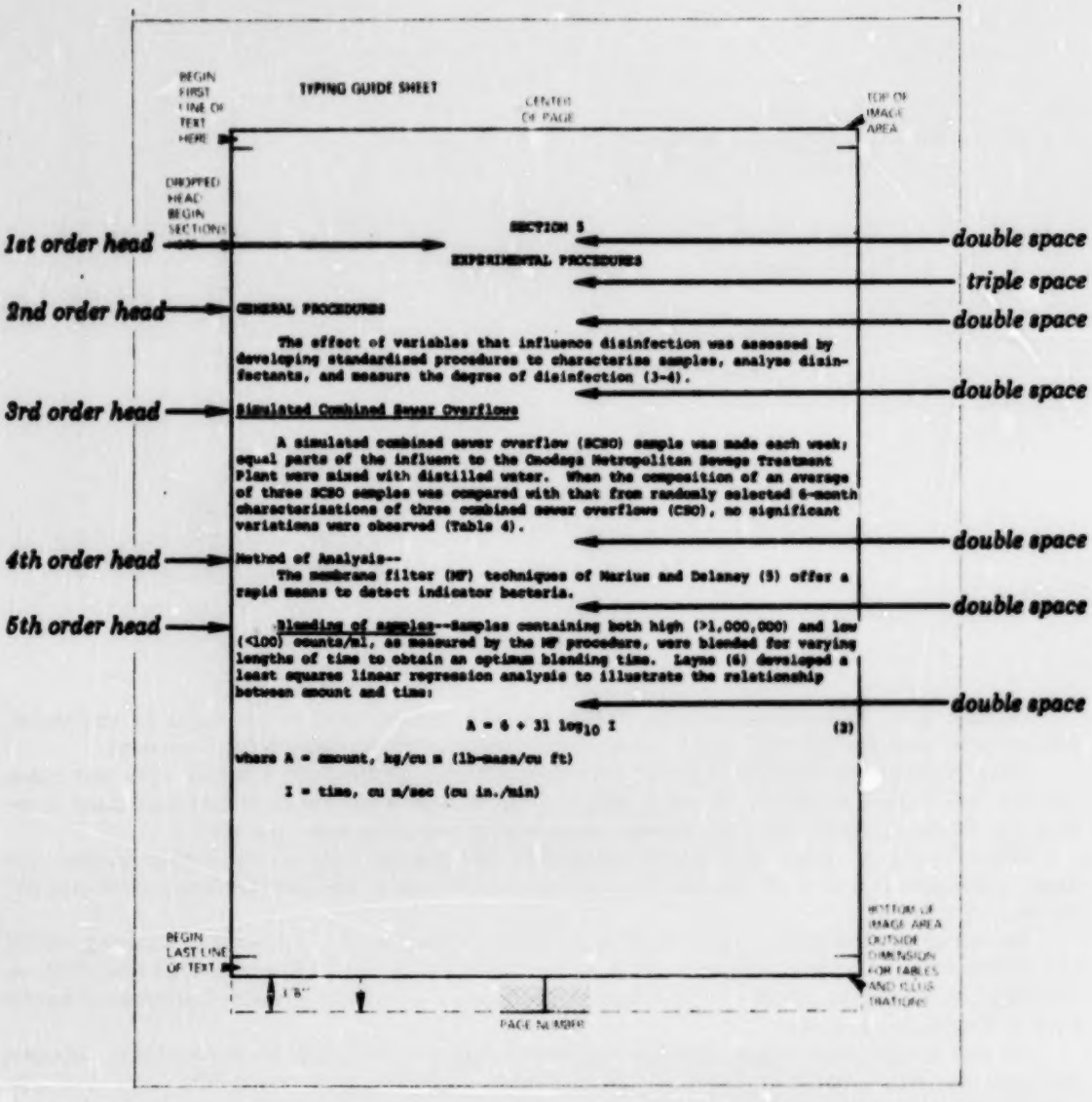
Usually, the conclusions can be stated on one page; when both conclusions and recommendations are short and straightforward, combine them.

**Sample M. Conclusions.**


TYPING GUIDE SHEET
BEGIN FIRST LINE OF TEXT HERE
CENTER OF PAGE
TOP OF IMAGE AREA
DROPPED HEAD BEGIN SECTION'S HERE
SECTION 3
RECOMMENDATIONS
The specific interrelationships between viral replication on hepatic endoplasmic reticulum and the drug-metabolising enzymes of the hepatic endoplasmic reticulum should continue to be investigated. Whether these phenomena are of major importance from the point of view of environmental protection or from a clinical health services point of view must be evaluated by the appropriate governmental agencies. They certainly are of considerable biological importance and should be investigated for the basic information to be gained if not for any other reason.
The effect of exposure to xenobiotic compounds on subsequent viral replication should be investigated in addition to investigating the effect of viral replication on induction of the drug-metabolising enzymes.
In spite of the study reported here and the reports of others in the literature, a good experimental model system for studying the interrelationships between microsomal drug-metabolising enzymes and viral replication is still lacking. A good experimental model must first be found and characterised before any substantial progress can be made in this interesting area of research.
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS
1.5"
3
PAGE NUMBER

When the research has been completed and the conclusions have been drawn, is further study or additional information needed to solve the problem? Is a pilot-scale feasibility study needed to reinforce the laboratory findings? Can the conclusions be applied now? Such suggestions for future investigations or activity can be included in a recommendations section. These need occupy but one page, or they can be combined into a conclusions and recommendations section.

**Sample H. Recommendations.**

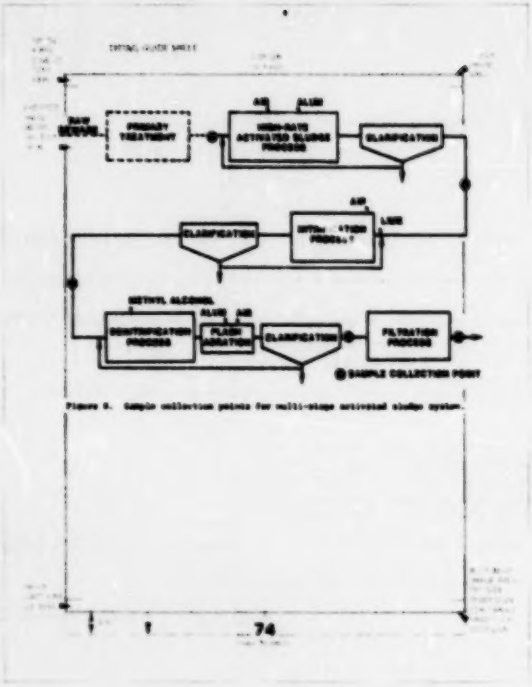

BEGIN FIRST LINE OF TEXT HERE
TYPING GUIDE SHEET
CENTER OF PAGE
TOP OF IMAGE AREA
(DROPPED HEAD) BEGIN SECTION)
1st order head
SECTION 5
EXPERIMENTAL PROCEDURES
double space
triple space
2nd order head
GENERAL PROCEDURES
double space
The effect of variables that influence disinfection was assessed by developing standardized procedures to characterize samples, analyze disinfectants, and measure the degree of disinfection (3-4).
double space
3rd order head
Simulated Combined Sewer Overflows
A simulated combined sewer overflow (SCSO) sample was made each week; equal parts of the influent to the Onodaga Metropolitan Sewage Treatment Plant were mixed with distilled water. When the composition of an average of three SCSO samples was compared with that from randomly selected 6-month characterizations of three combined sewer overflows (CSO), no significant variations were observed (Table 4).
double space
4th order head
Method of Analysis--
The membrane filter (MF) techniques of Marius and Delaney (5) offer a rapid means to detect indicator bacteria.
double space
5th order head
Blending of samples--Samples containing both high (>1,000,000) and low (<100) counts/ml, as measured by the MF procedure, were blended for varying lengths of time to obtain an optimum blending time. Layne (6) developed a least squares linear regression analysis to illustrate the relationship between amount and time:
double space
$A = 6 + 31 \log_{10} I$ (3)
where A = amount, kg/cu m (lb-mass/cu ft)
I = time, cu m/sec (cu in./min)
BEGIN LAST LINE OF TEXT
BOTTOM OF IMAGE AREA (OUTSIDE DIMENSION FOR TABLES AND ILLUSTRATIONS)
1.5"
PAGE NUMBER

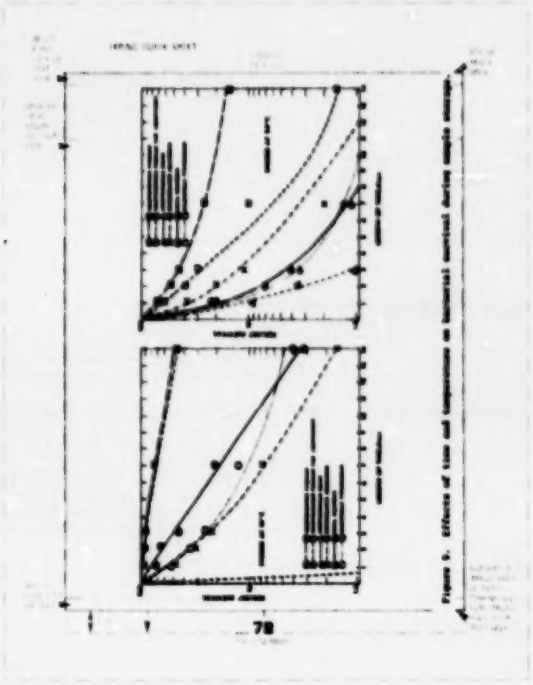
The sample page of text (above) is designed to illustrate some common situations that may be encountered while a manuscript is being prepared; it is intended only as an example.

The use of "headings" (one of many possible "Order of Headings") indicates how they should stand out from the text with their relative importance readily apparent. The spacing between the paragraphs and the headings is designed to aid this.

Other acceptable modes for numbering equations, citing and numbering literature references in the text, defining acronyms, using consistent abbreviations, etc., are illustrated.

**Sample O. Page of text.**





Because good illustrations enhance the value of technical reports, use them to emphasize, demonstrate, and summarize. Treat illustrations consistently throughout the document.

Place illustrations closely following their first reference in the text; combine with text when possible (see Figure 8 above). When a report contains only a few pages of text and many illustrations, however, place the illustrations in numerical sequence after the text.

When necessary, place illustrations broadwise (see Figure 9 above) on a page so that the head of the illustration is to the left, i.e., will be readable when the page is turned clockwise 90° for normal viewing.

In preparing illustrations, care must be exercised to ensure that details and lettering within the illustration are 6 points (about 1/12 inch) or larger and clearly legible after final reproduction. Photographs should be cropped or masked to eliminate insignificant details. Unnecessary border frames should be eliminated.

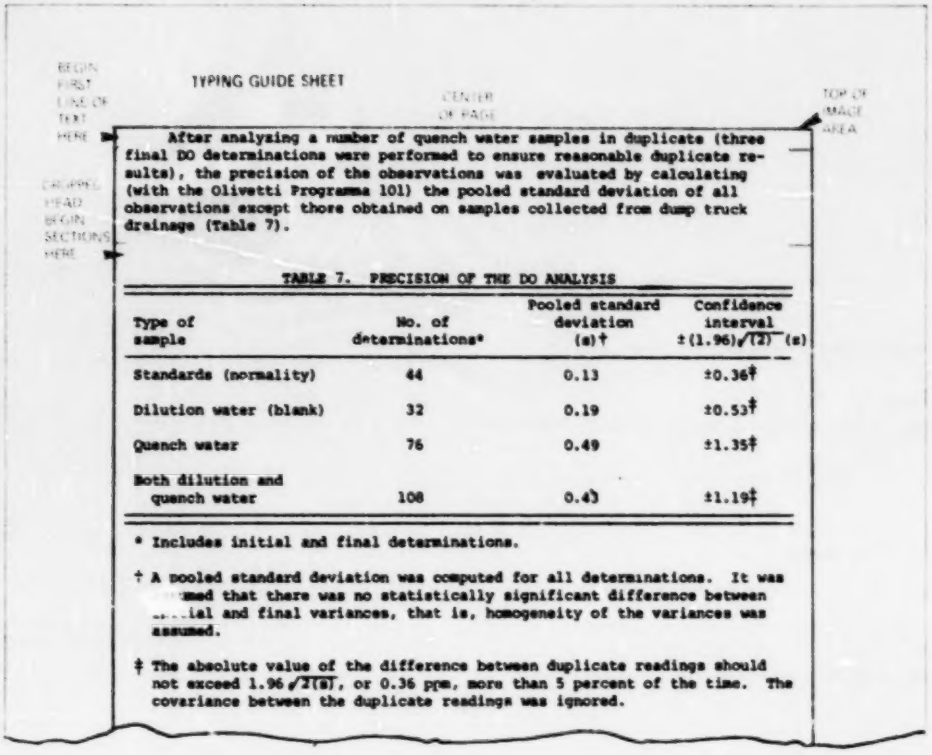
As far as practical, place lettering (callout; label) on an illustration horizontally, unboxed, and near the item identified. There should be high contrast and easy readability (sans serif type is preferred).

Number illustrations within the text with consecutive Arabic numerals preceded by the word "Figure" (Figure 1, Figure 2). Within appendices, include appendix letter (Figure A-1, Figure B-9).

Each illustration must have a descriptive legend. Center the legend beneath the illustration following the figure number. The legend is usually styled as a sentence; capitalize the first letter of the first word and any proper nouns or chemical or mathematical symbols, and close with a period.

If photographs are required, submit glossy black and white photo prints. Do not prepare art work for color reproduction when government printing is involved unless specifically authorized by the EPA Headquarters Printing Management Office. Rather than color printing, consider using screens, crosshatching, or similar techniques to provide the desired effect.

**Sample P. Illustrations.**



TYPING GUIDE SHEET

BEGIN FIRST LINE OF TEXT HERE

CENTER OF PAGE

TOP OF IMAGE AREA

CAUTION: HEAD BEGIN SECTIONS HERE

After analyzing a number of quench water samples in duplicate (three final DO determinations were performed to ensure reasonable duplicate results), the precision of the observations was evaluated by calculating (with the Olivetti Programma 101) the pooled standard deviation of all observations except those obtained on samples collected from dump truck drainage (Table 7).

TABLE 7. PRECISION OF THE DO ANALYSIS

| Type of sample | No. of determinations* | Pooled standard deviation (s)† | Confidence interval $\pm(1.96)\sqrt{(2)}(s)$ |
|---|---|---|---|
| Standards (normality) | 44 | 0.13 | ±0.36‡ |
| Dilution water (blank) | 32 | 0.19 | ±0.53‡ |
| Quench water | 76 | 0.49 | ±1.35‡ |
| Both dilution and quench water | 108 | 0.43 | ±1.19‡ |

* Includes initial and final determinations.

† A pooled standard deviation was computed for all determinations. It was assumed that there was no statistically significant difference between ...ial and final variances, that is, homogeneity of the variances was assumed.

‡ The absolute value of the difference between duplicate readings should not exceed $1.96\sqrt{2}(s)$, or 0.36 ppm, more than 5 percent of the time. The covariance between the duplicate readings was ignored.

When preparing tables, organize the tables as simply as possible for the reader. Use letters and numbers that will be easily readable and reproduce well; prepare printout sheets from electrically tabulated data so that letters and numbers are sharp and unbroken; if necessary, reduce printout sheets photographically to fit within the TGS image area.

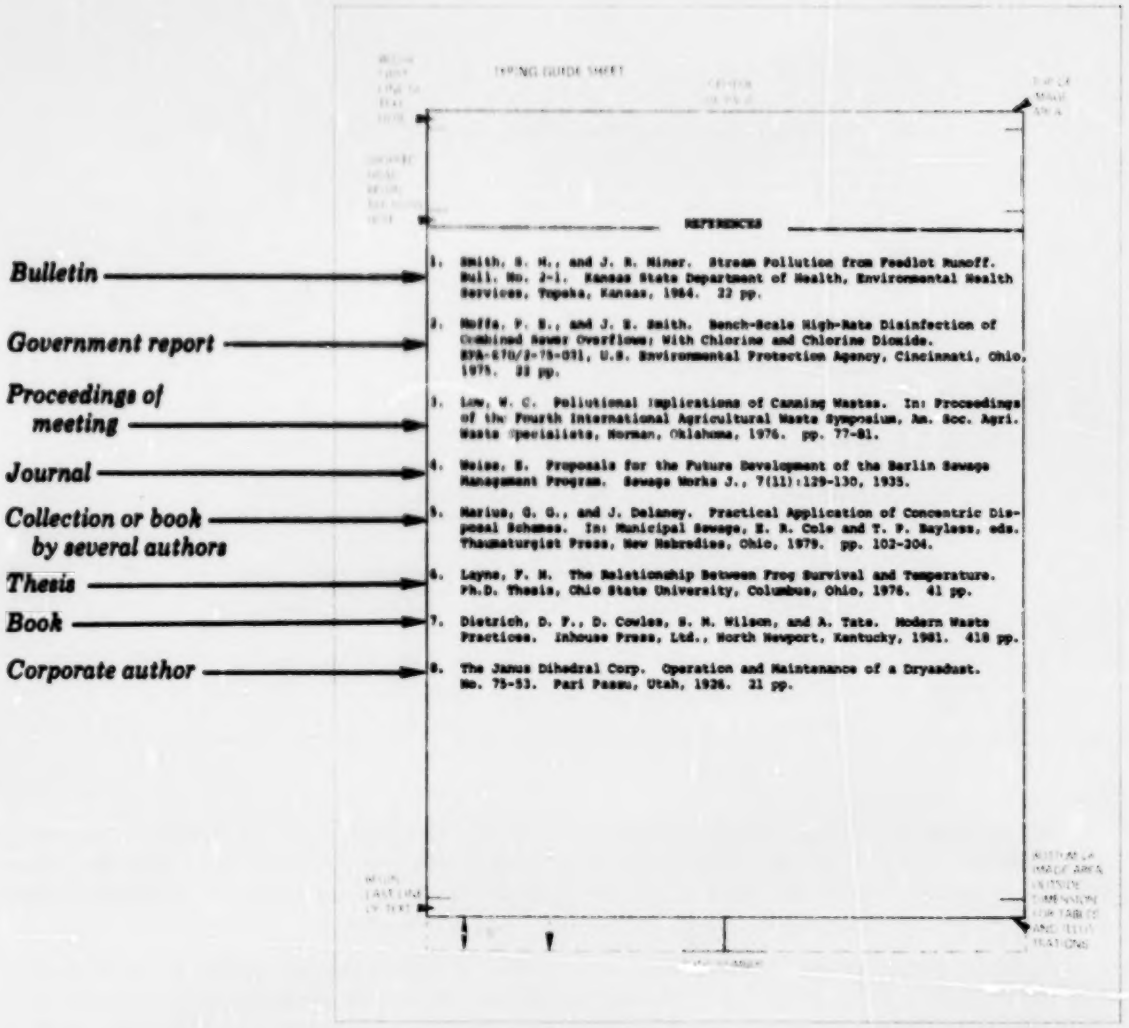
Number tables within the text with consecutive Arabic numerals, preceded by the word "TABLE" (TABLE 1, TABLE 2). Within appendices, include the appendix letter (TABLE A-1, TABLE C-3). Except for short, simple tabular data, which are run-in with the text, place a descriptive caption above each table after the table number. Type the caption in all caps, without a closing period.

When necessary, place a table broadwise on a page so that the head of the table is to the left, i.e., will be readable when the page is turned clockwise 90° for normal viewing.

Use symbols for table footnotes, e.g., *, †, ‡, §, #, as available; double their use, if needed. Assign the symbols consecutively, in normal reading order (across the table and from top to bottom). Superscript, lower-case letters may be substituted for symbols if their use will not confuse the reader.

When a long table is continued on two or more pages, note this continuation at the bottom of all but the last page, e.g., (continued). Repeat the table number and "continued," but not the table caption, on all the following pages, e.g., TABLE 4 (continued). Repeat the column headings, with rules, on each page.

**Sample Q. Tables.**


REFERENCES
1. Smith, S. M., and J. R. Miner. Stream Pollution from Feedlot Runoff. Bull. No. 2-1. Kansas State Department of Health, Environmental Health Services, Topeka, Kansas, 1964. 22 pp.
2. Moffa, P. E., and J. E. Smith. Bench-Scale High-Rate Disinfection of Combined Sewer Overflows: With Chlorine and Chlorine Dioxide. EPA-670/2-75-031, U.S. Environmental Protection Agency, Cincinnati, Ohio, 1975. 33 pp.
3. Law, W. C. Pollutional Implications of Canning Wastes. In: Proceedings of the Fourth International Agricultural Waste Symposium, Am. Soc. Agri. Waste Specialists, Norman, Oklahoma, 1976. pp. 77-81.
4. Weiss, E. Proposals for the Future Development of the Berlin Sewage Management Program. Sewage Works J., 7(11):129-130, 1935.
5. Marius, G. G., and J. Delaney. Practical Application of Concentric Disposal Schemes. In: Municipal Sewage, E. R. Cole and T. P. Bayless, eds. Thaumaturgist Press, New Hebredies, Ohio, 1979. pp. 102-204.
6. Layne, F. H. The Relationship Between Frog Survival and Temperature. Ph.D. Thesis, Ohio State University, Columbus, Ohio, 1976. 41 pp.
7. Dietrich, D. F., D. Cowles, S. H. Wilson, and A. Tate. Modern Waste Practices. Inhouse Press, Ltd., North Newport, Kentucky, 1981. 418 pp.
8. The Janus Dihedral Corp. Operation and Maintenance of a Dryasdust. No. 75-53. Pari Passu, Utah, 1926. 21 pp.
Bulletin
Government report
Proceedings of meeting
Journal
Collection or book by several authors
Thesis
Book
Corporate author

References concern source material cited in the document. Present this information in an accurate, uniform manner; use a style consistent with that of any reputable scientific or technical journal or society. Take care to include all essential elements of a reference: author(s), title, source, identifying numbers, pages, and date. The examples above illustrate citing references by the "number" system; an example of the "author-year" system is illustrated in Sample S, Bibliography. Either system is acceptable.

To aid in reading from microfilm, a reference should be identified completely at the bottom of the page on which it occurs. When references are numerous, list them in a "References" section of the report. Exercise judgment; the length and complexity of the report may well be the determining factor.

Personal communications are not considered references; if necessary, include them, in parentheses, within the text.

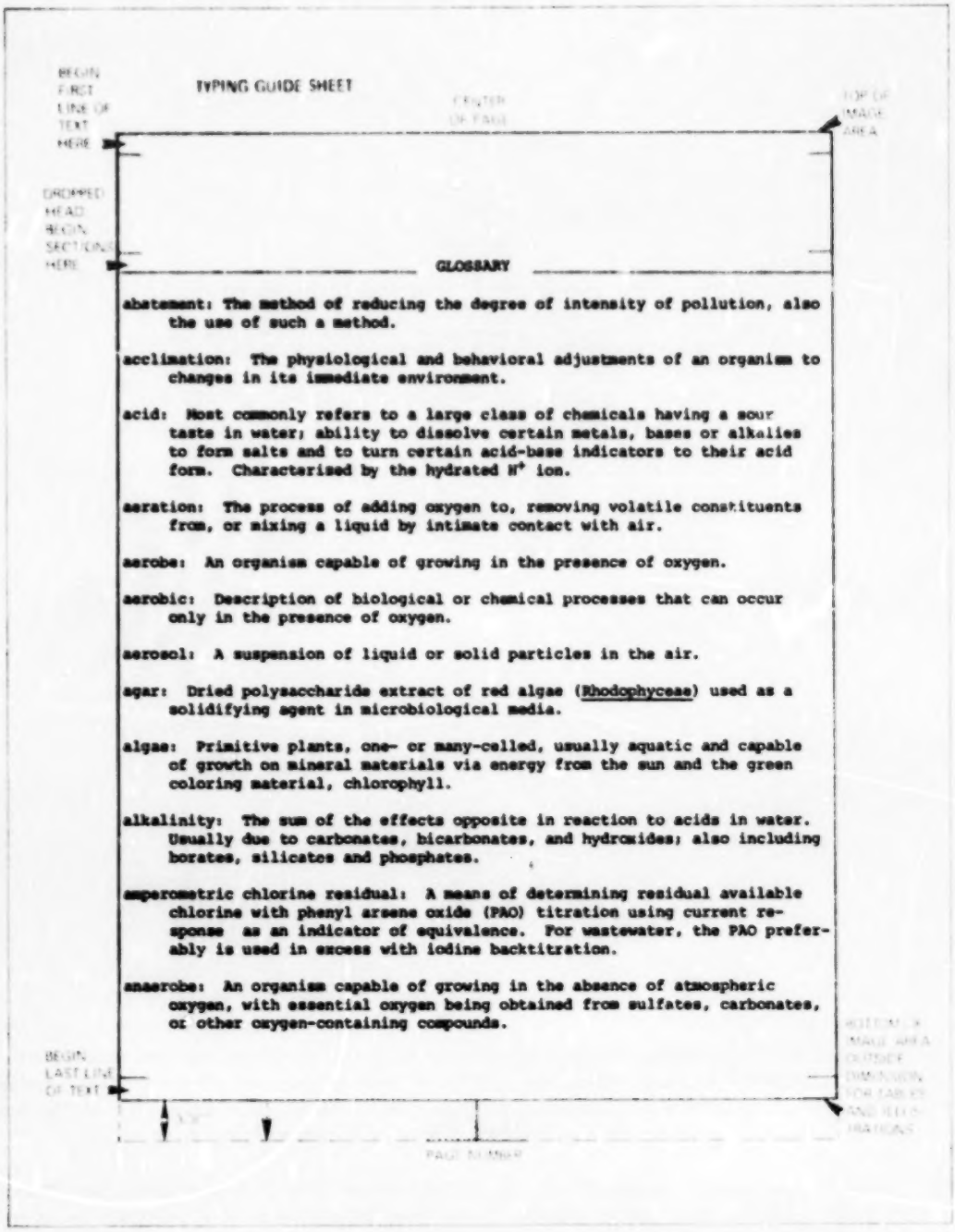
**Sample P References.**

TYPING GUIDE SHEET
SECTION II
BIBLIOGRAPHY
Dutt, G. R., M. L. Shaffer, and W. J. Moore. 1972. Computer Simulation Model of Dynamic Bio-physiochemical Processes in Soils. Ariz. Agr. Expt. Sta. Tech. Bull. 1965. 101 pp.
Gupta, S. C. 1972. Salt Flow in Soils as Influenced by Water Flow, Root Extraction and Exchange. Ph.D. Dissertation. Utah State University, Logan, Utah. 112 pp.
King, L. G., and R. J. Hanks. 1973. Irrigation Management for Control of Quality and Irrigation Return Flow. EPA-R2-73-265, U.S. Environmental Protection Agency, Washington, D.C. 47 pp.
Nimah, M. N., and R. J. Hanks. 1973a. Model for Estimating Soil, Water and Atmospheric Interrelations: I. Description and Sensitivity. Soil Sci. Soc. Amer. Proc. 37:520-532.
Nimah, M. N., and R. J. Hanks. 1973b. Model for Estimating Soil, Water and Atmospheric Interrelations: II. Field Test of the Model. Soil Sci. Soc. Amer. Proc. 37:533-621.

Bibliographic entries provide supplementary sources for information on the subject of the document. Present this literature, which has not been cited in the text, in an accurate, uniform manner. There are many modes of presenting reference and bibliographic data; two of the many approaches for form and punctuation are illustrated here in Samples R and S.

List bibliographic entries alphabetically by senior author (the examples above illustrate the "name-and-year" system); take care to include all the essential elements of a reference (author(s), title, source, identifying numbers, pages, date). Be sure to use a style consistent with that of any reputable scientific or technical journal or society. Within any one report, have the punctuation, capitalization, abbreviations, etc., of the bibliography agree with that used for the reference section.

**Sample S. Bibliography.**


TYPING GUIDE SHEET
GLOSSARY
abatement: The method of reducing the degree of intensity of pollution, also the use of such a method.
acclimation: The physiological and behavioral adjustments of an organism to changes in its immediate environment.
acid: Most commonly refers to a large class of chemicals having a sour taste in water; ability to dissolve certain metals, bases or alkalies to form salts and to turn certain acid-base indicators to their acid form. Characterized by the hydrated H+ ion.
aeration: The process of adding oxygen to, removing volatile constituents from, or mixing a liquid by intimate contact with air.
aerobe: An organism capable of growing in the presence of oxygen.
aerobic: Description of biological or chemical processes that can occur only in the presence of oxygen.
aerosol: A suspension of liquid or solid particles in the air.
agar: Dried polysaccharide extract of red algae (Rhodophyceae) used as a solidifying agent in microbiological media.
algae: Primitive plants, one- or many-celled, usually aquatic and capable of growth on mineral materials via energy from the sun and the green coloring material, chlorophyll.
alkalinity: The sum of the effects opposite in reaction to acids in water. Usually due to carbonates, bicarbonates, and hydroxides; also including borates, silicates and phosphates.
amperometric chlorine residual: A means of determining residual available chlorine with phenyl arsene oxide (PAO) titration using current response as an indicator of equivalence. For wastewater, the PAO preferably is used in excess with iodine backtitration.
anaerobe: An organism capable of growing in the absence of atmospheric oxygen, with essential oxygen being obtained from sulfates, carbonates, or other oxygen-containing compounds.

Consider the glossary as a partial dictionary where technical or abstruse terms that might not be readily known can be listed and explained. Its need might well depend on the intended audience for the report.

**Sample T. Glossary.**

INDEX


Abbreviations, 9, 20, 25
Abstracts, 16
Acknowledgments, 4, 12, 21
Acronyms, 25
Applicability of specifications, 1

Bibliographies, 29

Callouts, 26
Color printing, 8, 26
Conclusions, 23
Contents, 17
COSATI Subject Category List, 3
Covers, 7
Credit lines, 4, 12, 21

Deviations, 1
Disclaimers, 5, 13
Divider pages, 9
Double-spaced report, 8
Draft (preliminary), notice of, 5

EJC Thesaurus, 3
EPA 2220-1 Form, 3, 12, 16, 32
Equations, 8, 25
Exclusions (from specification coverage), 1
Extramural agreement concerning
  specifications, 2

Figures, 9, 11, 18
Fold-ins, 9
Footnotes, 9, 27
Foreword, 14

Glossary, 30
Government Printing and Binding
  Regulations, 3
GPO Style Manual, 3, 8, 9

Headings, 8, 25

Illustrations, 9, 11, 18, 26
Image area, 7, 11
Index, 31
Introduction, 22

Leadering, 17
Legend on illustration, 26
List of abbreviations and symbols, 20
List of figures, 18
List of tables, 19

Metric Practice Guide, 4
Metric units of measure, 5

Nonapplicability of specifications, 1
Numbering
  illustrations, 26
  pages, 8
  references, 28
  reports, 7
  tables, 27

Order of elements, 6
Organization of report, 6

Page numbering
  assigning numbers, 8
  placement on typed page, 11
Paper saving, 9
Permission to reprint, 4
Personal communications, 28
Photographs, 26
Preface, 15
Print size, 7, 26
Privately owned information, 5

Recommendations, 24
References, 25, 28
Report numbering, 7
Reprinting, permission for, 4

Single-spaced report, 8
Size of print, 7, 26
Spacing of typed material, 8, 25
Spine copy, 9
Style Manual, GPO, 3, 8, 9
Style manuals, 3, 8, 9, 31
Supplemental information sources, 3
Symbols, 20

Tables, 9, 11, 19, 27
Technical Report Data form, 3, 12, 16, 32
Thesaurus of Engineering and Scientific
  Terms, 3
Title page, 12
Trade names, trademarks, 4, 5
2220-1 Form, 3, 12, 16, 32
Type size, 7, 26
Typing Guide Sheet, 8, 11, 27
Typing, spacing of, 8, 25

Units of Weight and Measure, 4

Waiver, deviations from specifications, 1
"Work-done-under" statement, 16


**The simple one-page index illustrated above is, in fact, an index for this specification book.**

**Instructions on indexing can be found in the *CBE Style Manual*, 3d ed., Council of Biology Editors, Committee on Form and Style, 1972 (available from American Institute of Biological Sciences, 3900 Wisconsin Avenue NW, Washington, D.C. 20016) or in *A Manual of Style*, 12th ed., rev., University of Chicago Press, Chicago, IL, 1969.**

**Sample U. Index.**

**TECHNICAL REPORT DATA**
*(Please read Instructions on the reverse before completing)*

| | |
|---|---|
| 1. REPORT NO.<br>(EPA report number) TIS<br>2.<br>(blank) | 3. RECIPIENT'S ACCESSION NO.<br>(blank) |
| 4. TITLE AND SUBTITLE<br>COMPLETE TITLE: type main title in all caps | 5. REPORT DATE<br>(date of issue) TIS<br>6. PERFORMING ORGANIZATION CODE<br>(usually blank) |
| 7. AUTHOR(S)<br>all authors | 8. PERFORMING ORGANIZATION REPORT NO.<br>(usually blank) |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>complete address of extramural organization | 10. PROGRAM ELEMENT NO.<br>Project Officer supplies<br>11. CONTRACT/GRANT NO.<br>Project Officer supplies |
| 12. SPONSORING AGENCY NAME AND ADDRESS<br>Laboratory Name<br>Office of Research and Development<br>U.S. Environmental Protection Agency<br>City, State, and Zip Code | 13. TYPE OF REPORT AND PERIOD COVERED<br>Project Officer supplies<br>14. SPONSORING AGENCY CODE<br>EPA-ORD (same for all reports) |
| 15. SUPPLEMENTARY NOTES<br>Prepared by Project Officer if applicable. | |
| 16. ABSTRACT<br>Prepared by Project Officer. | |

| 17. KEY WORDS AND DOCUMENT ANALYSIS | | |
|---|---|---|
| a. DESCRIPTORS | b. IDENTIFIERS/OPEN ENDED TERMS | c. COSATI Field/Group |
| Project Officer: use only terms listed in the Engineers Joint Council's "Thesaurus of Engineering & Scientific Terms" (available from NTIS or see Technical Information Coordinator (TIC))<br><br>NOTE: mark important terms with (*) | Use terms, including geographical locations and trademarked names, not in the EJC "Thesaurus. . ." | Select field/group from "COSATI Subject Category List" (available from NTIS or TIC) |
| 18. DISTRIBUTION STATEMENT<br>RELEASE TO PUBLIC (always the same) | 19. SECURITY CLASS *(This Report)*<br>UNCLASSIFIED (same)<br>20. SECURITY CLASS *(This page)*<br>UNCLASSIFIED (same) | 21. NO. OF PAGES<br>(total, all pages)<br>22. PRICE<br>(blank) |

EPA Form 2220-1 (9-73)

**Sample V. Technical Report Data sheet, EPA Form 2220-1.**



☆U.S. GPO: 1976 - 657-695/5417 Region No. 5-11